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HOUSEHOLD HYGIENE

By

J. C. GEIGER, M. D.

Director, Department of Public Health
San Francisco, California

1940

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PREFACE



In the preparation of this Manual of Household Hygiene it is a pleasure to acknowledge the aid of M. S. Marshall and Herbert G. Johnstone of the University of California Medical School, and of the following members of the Department of Public Health of the City and County of San Francisco: Emmett E. Sappington, George H. Becker, R. W. Burlingame, and A. B. Crowley.

J. C. Geiger, M. D.

Director of Public Health.

January 1940

PART I.

EXTERMINATION OF RODENTS, INSECTS, VERMIN AND NOXIOUS WEEDS

FOREWORD

Because certain insect pests are capable of transmitting disease to man, people have been wont to associate all pests of this nature with public health and disease. As a result, public health departments receive innumerable requests for information relative to all types of household and garden pests, many of which have little or no bearing upon public health. This manual is written in order to stimulate interest in destruction of household pests, disseminate information on the subject, and at the same time save a great deal of the time of the Department of Public Health that might otherwise be devoted to answering individual inquiries that are constantly being made.

While it is true that certain of the pests discussed herein can become extremely annoying and interfere with the comfort and enjoyment of the home, they are of no significance from a public health aspect. They do, however, cause housekeepers to become so exasperated as to give up all hope of ever being able to go about their daily routines without being annoyed by some member of the insect world. It is hoped that this pamphlet may aid in ridding our community of the many pests with which we must live daily, and make it a cleaner and more comfortable city.

References to scientific classifications and descriptions of pests, such as family names, species, medical terminology, etc., have been intentionally avoided throughout this manual, so that the purposes for which this publication was written would be best accomplished.

GARDEN AND HOUSEHOLD PESTS

As this article emanates from the San Francisco Department of Public Health, the various pests will be discussed proportionally to their actual, rather than potential, importance to public health in this community. It may be stated as criteria that **LIGHT, CLEANLINESS** and **VENTILATION** ARE ENEMIES TO ALL HOUSEHOLD PESTS.

RODENTS

Under this heading there are considered rats, mice, ground squirrels, chipmunks, skunks and wild rabbits.

RATS are the most repulsive, destructive and dangerous of this group. Space does not permit historical data in relation to this pest. The rat is a very prolific animal, capable of reproducing three to five times each year, bringing forth from five to ten, and sometimes as many as twenty progeny.

Diet: The diet upon which the rat exists is variable and includes seeds of every kind, grain, meal, flour, all food products, garden vegetables; bulbs, roots, leaves, stems, mushrooms, bark of growing trees, flowers of herbaceous plants; eggs, ducklings, chickens,

young rabbits and squabs; milk, butter and cheese; fish, frogs, mollusks and crustaceans; fresh meat of all kinds and carrion. Rats are at times particularly fond of a certain type of glue used in the binding of books, and have been known to attack young children when really hungry. The rat is also a cannibal.

Habits: The roof rat and the black rat live in the walls of buildings or in the space between ceilings and roofs. In buildings, the brown rat keeps mainly to the cellar and lower parts. Rats are nocturnal in habit and emerge in nightly excursions in search of food from their burrows, which are located in the vicinity of sewer outfalls, garbage heaps and other such places. By day, they move slowly and apparently uncertainly when in the open, but when in contact with the side of a wall they move with great rapidity, which indicates that their "whiskers" serve as feelers and that their delicate sense of touch serves them in good stead.

Disease: The rat has been feared for the part that it plays in the dissemination of plague. This dread disease is transferable to man through the flea; therefore contact with dead rodents should be avoided as much as possible. Fleas begin to leave any rodents immediately after death.

Other diseases are: Trichinosis, indirectly transferable to man through swine whose infection has generally occurred through rats; acute infectious jaundice (Weil's Disease), transferable to man by contact with rat urine.

Rats and mice are also carriers of the paratyphoid enteritidis group of bacteria, which are associated with certain types of food poisoning.

Control: The cardinal points in the control of rats are: scrupulously clean conditions throughout premises and yards, rat-proofing of buildings, protection of food, proper storage and prompt removal of garbage; traps, poisons, domestic animals such as cats and dogs, natural enemies, shooting and fumigation.

Rat-proofing of Buildings: This function is of first importance in any campaign against rats. Concrete basement and floor areas and foundations are essential; and all pipe openings and other openings should be screened with 1½" wire mesh.

Extermination: Under this heading it is well to mention a simple but all-inclusive important fact; that is, the rat requires two conditions for comfortable existence: (1) a plentiful food supply, (2) desirable isolated place for nesting and breeding. Eliminate either and the rats will leave.

Should a rat infestation occur within your premises, it is not advisable to promiscuously set traps and spread poison. A little common sense in the form of a survey of the building and plan of attack is first in order. Signs of rats may be evidenced by their droppings. Careful tracing of these to the source of entrance to the premises, or to nests within the premises, is advisable. You may then set traps at points of vantage. Traps of various kinds

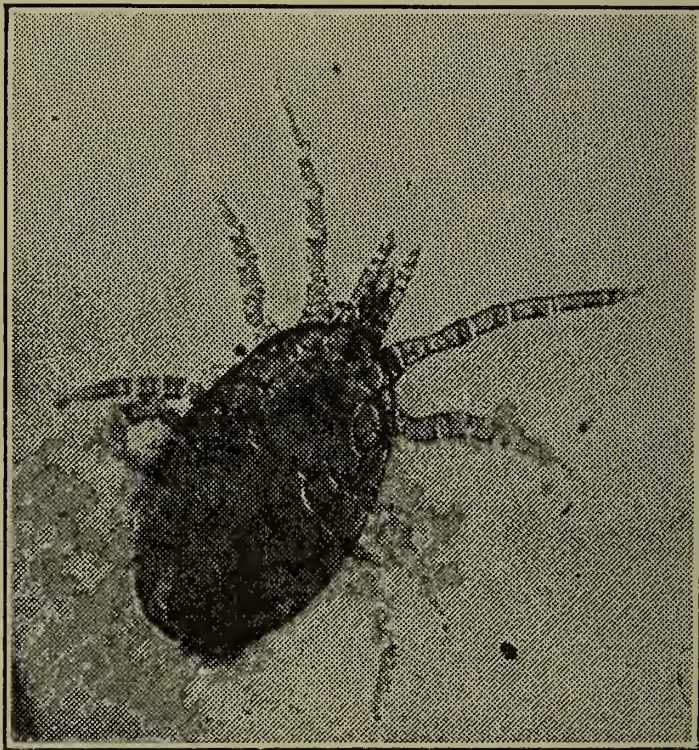
have been found to be effective. The type to be used should be decided upon according to the location and extent of infestation. In placing traps it is well to remember that the animals always prefer narrow places as runways. Traps in which rats have been caught should **not** be washed, scalded or smoked. A trap seems to be more attractive after it has seen service. Bait should be fresh and attractive. Bacon, cheese and pork are all desirable baits; but one should remember that as these materials age they may act as a repellent rather than a bait. In setting traps, triggers should be tested to assure proper action, and care should be exercised in placing the bait so that the trigger will be released with the slightest touch. Traps should be inspected once each day, and any animals caught therein promptly removed. In removing the carcasses of rats, it is good policy to have paper bags available in which to insert the rat carcass, avoiding personal contact as much as possible; then twist the top of the bag, so that if there are any fleas on the dead rat they will be unable to escape. One of the best methods of disposal of the carcass is incineration.

Poisons: Poisons are objectionable in most buildings due to the resulting odor from rats that may die in inaccessible places. They are of some benefit in garbage dumps, stables, warehouses, granaries, and wharves. Poisons are particularly objectionable in dwellings because of danger to children and domestic animals; and furthermore, special knowledge

and experience is required for efficacious use of poisons.

Domestic Animals: Certain small dogs may be relied upon to assist in keeping premises free of rats, particularly, small Irish, Scotch and fox terriers. Most house cats, though of value in killing mice, are apparently too well fed or too lazy to attack such a formidable foe as the rat.

Rat Mites: The blood-sucking rat mite may at times leave its usual host, invade homes,



Rat mite (35x)

NOTE—Spot shows actual BODY size

and prove to be a most annoying and troublesome pest of man. These parasites are almost microscopic in size and are difficult to locate. They do not remain attached to the body of

the host but drop off after each blood meal. The mites are very active and crawl about over the body biting frequently. The bite is distinctly painful and irritating and the itching may last for several hours. Reddened areas and blisters may develop at the location of the bite. Since this mite is a parasite of rats, control measures outlined for the destruction and eradication of these rodents should be followed. In addition to rat control floors, tables, chairs and woodwork should be rubbed with a cloth moistened with kerosene. Ceilings of clothes closets should be carefully inspected since the mites drop onto and infest wearing apparel. The mites may travel from one floor to another along pipes extending through the floor.

The Mange or Itch Mite: Scabies or itch of man is produced as a result of the activities of a mite so small ($1/77$ inch in length) that it is just visible to the naked eye. The mites infest the skin, and an acrid fluid liberated by them causes intense itching and local irritation. The female mite burrows into the skin and forms tunnels in which she deposits her eggs. As results of both the burrowing and egg-laying activities of the mite, and the subsequent development of larval forms, small blisters are formed on the surface of the skin in the regions of the infested areas. To counteract the constant itching and irritation the person harboring these troublesome parasites scratches incessantly, resulting in an extension of the condition. Frequently the effects produced

by scratching exceed by far the trouble produced by the mites. The small blisters are ruptured and scabs or crusts develop.

The mite is spread from person to person by close contact with those infested or by the exchange of clothing or bedding. There are several types of mites, closely resembling those found on man, which infest the lower animals such as dogs, goats, sheep and horses, and there is no doubt that at times such animal forms may be transmitted to human beings.

In the case of scabies the treatment must be carefully controlled and infested persons should secure the advice and care of a physician. The clothing and bedding of such persons should be boiled or subjected to steam or dry heat.

The **MOUSE**, though a small rodent, is sometimes responsible for a great deal of excitement among housewives. It can become a very annoying and damaging household pest.

Habits: The female mouse usually produces a litter of four to six young, six or seven times a year. The mouse is keen-sensed and, like the rat, is nocturnal in habit. It, too, prefers narrow runways, and as a rule stays in close proximity to walls while traveling, employing the sense of touch as well as sight and smell for assistance.

The mouse prefers fresh foodstuffs. Its dietary habits correspond closely to those of man.

The nest is usually of soft materials, and is built in dark, isolated places such as in storage

rooms, under woodpiles and in closets used for storage of miscellaneous household goods.

The mouse forages at night, and may travel from floor to floor in search of food.

Disease: Mice have been found to be responsible for the contamination of foodstuffs, and responsible for food-poisoning outbreaks.

Extermination: Whenever signs of mice are noticeable within a building, the extent and location of infestation can be estimated by the accumulation of excrement. At times people are of the opinion that their premises are heavily infested because they see or hear mice in various places upon the premises. Infestation of homes may consist of a population of two to twenty, but all may be successfully destroyed.

Traps are most efficacious, the snap trap being the most consistent killer. Baits of cheese, bacon and pork are recommended. All should be used at the same time in various traps, allowing choice of diet, a selection being more efficient than one type of food.

In placing traps it is always well to remember that narrow runways and close proximity to walls are the most advantageous locations. Find runways, means of entrance to a room or building, and nesting place, by tracing sign of excrement; placing traps accordingly. Do not place one or two traps at random and expect results. Traps are cheap—use many.

DO NOT place large baits in traps. Use very small portions attached to the trigger in such manner as to make it a bit difficult for the animal to obtain.

Inspect traps once each day, remove dead animals, and bait with fresh food.

After a number have been caught and the traps are empty, each day thereafter continue baiting for a week or ten days, as there may be others, or if the means of ingress to the premises have not been efficiently blocked, another infestation may occur.

Remember that mice are small and capable of passing through very small spaces.

Other Rodents: Ground squirrels, wild rabbits, chipmunks and skunks—these can hardly be classified as household and garden pests of a large city. They are particularly mentioned because they are pests in rural areas where they are looked upon by our weekend city visitors as something with which to play or hunt. The first three, however, are significant from a public health standpoint. The last is of importance only because of the innumerable frantic phone calls registered with the health department whenever one of these little animals decides to take possession of a rear yard of some home in an outlying section of the city.

Avoid contact with ground squirrels, wild rabbits and chipmunks, especially with the carcasses or seemingly sick or slow-moving animals.

Ground Squirrels and Wild Rabbits should be avoided because of plague and tularemia respectively, transmitted to man by the flea as in plague and in tularemia by certain types of ticks and other insects and by contact of the rabbit with the skin of humans.

Chipmunks, though attractive, are potential health hazards so they are better left alone. Relapsing fever and plague may be transmitted to human beings by certain lice or ticks on the animal or in the nest.

ANTS

ANTS, generally speaking, are of no public health significance, but are a true household pest. Their mere presence within a building is cause for annoyance.

Habits: There are two types of ants that usually give trouble within the household—the house ant and the brownish black ant. The former is yellowish in color, and nests and breeds in the walls of heated buildings. The latter is the species most commonly encountered. It is a sand ant and nests outdoors, subsisting on food from kitchens, pantries, garbage cans, or other places where foodstuffs or offal are stored without protection, or carelessly strewn about. They have an incredible ability for invading cupboards, coolers and other containers wherein foodstuffs are kept, particularly so in the case of sugar, candy, syrup, cookies and other sweets. Once an accessible food supply is discovered, it is immediately reported to the entire colony and in a very short time the premises may be swarming with these annoying visitors.

Control: Control sometimes requires patience and alertness in being able to trace the ant trails back to the nest, which can be located by following the “worker” ants to their point of disappearance. The inmates may some-

times be killed by injecting carbon disulphid, kerosene or gasoline into the opening by means of a small oil can or syringe. In using these substances, however, remember that the materials are inflammable and explosive, and every precaution should be taken against creating a fire hazard or inflicting personal injury. Other means of control are contact insecticides, repellents and traps.

Before spreading poisonous ant powder repellents or other such material, it is always efficacious to first remove attractive foods wherever practical.

Prompt cleaning up of scattered food and keeping food which may be attractive in ant-proof metal containers or refrigerators will help to limit the annoyance of their presence. Use of repellents and poisons in connection with household food supplies is impractical. Excellent results have been accomplished by dusting ant runways with sodium fluoride powder; but caution should be exercised in the use of this material as it is poisonous to man. Effective means in controlling or exterminating nests in the open areas of yards, basements, etc., are as follows:

Where a few nests are involved in a concentrated area, drenching the nest with boiling water or injecting a small amount of kerosene will be effective. Another good procedure is to spray the ground areas with a very strong soap water prepared by dissolving common laundry soap in the proportion of three-quarters of a pound to a gallon of water. Carbon disulphid has been mentioned previously. This material

can be purchased at any drug store but must be carefully handled.

When injecting liquids into ant nests, a sharp stick or garden tool should be used to enlarge the entrance in order to be certain that complete saturation of the nest is obtained. After such treatment, it is well to saturate a cloth with the liquid, or simply drench a cloth with water and place it over the entrance to the nest.

A recent and very effective means of keeping ants out of homes is to ant-proof the premises. This is done by placing certain containers containing poison mixed with foodstuffs especially attractive to ants in such manner as to cover all means of entrance to premises. Before doing this, however, it is always best to dust out ant trails or destroy ant nests. As a rule this is usually done by service companies for a small sum and is guaranteed for one year, and may be readily repeated each year thereafter. This method, if properly done, does not require servicing at frequent intervals.

FLIES

Of all domestic pests, the house fly no doubt is the most constant nuisance throughout the entire year. Fly-reduction is an essential project to be undertaken by all housewives to assure safer and more comfortable enjoyment of the home. The fly is a pest, and activities for its extermination should be constantly carried out in the home and elsewhere. The fly may at times play a role in the dissemination of certain diseases.

Habits: Most flies prefer the sunshine, but species vary greatly in their habits and breeding places. The female house fly lays about 120 eggs at one time and a generation is produced approximately every twenty days at summer temperatures. Obviously, countless millions can come from a single fly during a single season. The eggs are usually laid in masses in certain favorable places. From egg to maturity takes about ten days.

Most flies die in early autumn. Those that remain and find their way into protected heated buildings usually die out during winter months. The fly can continue to breed throughout the winter in warm places where food and breeding materials are present. The common house fly usually chooses for its breeding place manure heaps, human excrement, fermenting vegetables and putrefying animal matter, poultry pens, refuse, carcasses of various animals, soil area of cattle corrals, garbage, and organic material of all kinds. From this it is obvious that if we allow the accumulation of filth, or improperly controlled use of, or storage of manure, etc., then we can expect a heavy fly population. The larvae of the fly may not at all times be visible. They have a tendency to burrow in loose ground, just beneath the surface, under boards, stones, platforms, etc.

The biting stable fly is very similar to the house fly in its life history, but requires a little longer time to undergo a complete life cycle.

Danger to Public Health: It is sufficient to emphasize the fact that flies may be a definite health hazard. Science has conclusively shown that a single fly may have as high as six and one-half million bacteria on its entire surface, and twenty-eight million bacteria in its intestinal tract.

Flies may transmit disease either as mechanical carriers due to contact with infected material and subsequent contact with prepared foodstuffs, or the biting fly has been reported as transmitting infections.

Control: The first and most important measure is proper fly-screening of all premises. Self-closing screen doors on rear porches, screened windows and screened porches will keep premises practically free of fly invasions.

Other measures employed in the control of flies are numerous. Because of the necessity of exterminating flies, it might be well to dwell upon this subject in detail, in order to stimulate interest in minimizing the nuisance caused by these undesirable pests.

“SWAT THE FLY” is a perpetual campaign slogan of which all persons should be constantly mindful. As the slogan implies, a simple method of extermination is the use of a fly swatter. This, however, is only of value within the home when very small numbers of flies have managed to gain entrance.

The most effectual suppression of the house-fly is by attacking its breeding places. First, cleanliness of our environment is necessary. Neglected premises mean more flies. Garbage should be kept in water-tight cans with tight-

fitting covers that should be in place at all times, being opened only when garbage is being placed in the can. Refuse should not be allowed to accumulate, but should be removed promptly from the premises. Killing adult flies by various methods is one way of destroying a visible annoying menace, but even though a person could accomplish the complete extermination of a local adult population, this would only be a temporary expedient if the breeding places and the larvae present in the breeding places were not destroyed.

A great many poisons and sprays used on adult flies are ineffective on fly larvae. Therefore, other means must be used in order to destroy the larvae of the fly. The best results are obtained in this connection through the use of borax which has a distinct larvicidal action. Borax should be applied around outer edges of refuse heaps, manure piles and garbage dumps. It may be applied to floors of barns, stables and on surfaces of rear yards. Whenever fertilizer of any nature is used in gardens, it should be covered with a coating of borax in the proportions of approximately one-half pound for every ten square feet. This chemical apparently does not impair the fertilizing value.

Other Methods of Extermination: Fly traps have been used successfully and are most efficient when there is no soil pollution problem or other factors to compete with the fly-trap bait.

Sticky flypaper, electric fans, and other such well known measures will help to dispose of a

limited number of flies, but are not complete control measures.

There are many sprays available on the market today, the greater portion of which are quite effective in the extermination of flies. In this connection a word of warning is in order. Most of these materials indicate on the container that the contents are inflammable; therefore, they should be used with caution, or not at all, around flames. The statement also emphatically indicates the material to be harmless to human beings. There is a question of doubt as to whether or not certain individuals may or may not be allergic to some of the ingredients generally used in fly sprays. It is therefore well to be cautious at all times in the use of these compounds. It is always good policy to use great care in applying insecticides of any nature, particularly around foodstuffs. Insecticides should be applied in a manner that affords the utmost protection to human beings, particular attention being given to the protection of the skin.

Determined relentless extermination of this pest can bring dividends in comfort and preservation of health that are well worth the exertion. "SWAT THE FLY!"

FLEAS

This insect, although small, is of tremendous importance as a potential public health hazard. As the name of the human flea (*Pulex irritans*) implies, it is a distinct disturbing factor to human beings during the day while at work or at play, as well as during those hours spent in sleep.

Certain sections of the world seem to be more heavily infested with this pest than others—undoubtedly climate is a factor. In California, and particularly in the vicinity of San Francisco, you sometimes hear people state that the flea is a native. This is an erroneous, unfounded and untrue statement. Many times visitors to our climate will remark that they have been terribly disturbed by fleas, blaming the locality. On the other hand, the majority of visitors to this section are rarely



Flea (17x)

NOTE—Spot shows actual BODY size

disturbed by this insect. This is also true of those who have lived all of their lives in this area of the country. Some are never disturbed or feel the effects of the presence of the flea, while others are constantly bothered and suf-

fer considerable annoyance. Hence it seems this matter is an individual problem.

Habits: Fleas as a rule prefer certain hosts, but are not particular and will leave their hosts to feed on others. This is one reason that the flea is a potential danger to public health. There are many species of fleas—in fact, too many to mention. However, aside from the *Pulex irritans* (human flea) there is the cat flea, the dog flea, the rat flea, the squirrel flea, and others.

The flea primarily concerned in the transmission of plague to man is the rat flea of a special type.

The adult flea feeds on blood only, and if undisturbed will feed for a surprisingly long period. The average life of a flea under normal conditions is three to four months, but under experimental conditions fleas have been kept alive for years.

The female lays her eggs directly on the ground, or while on the host, usually in the hair. Complete development of the human flea takes approximately four weeks in summer months, and two to three weeks longer in winter months.

Flea infestation of premises may spread rapidly. The spread is usually caused by the removal from a host. For instance, if the ordinary host is eliminated, dog and cat fleas will invade the home and attack human beings. It has been said that fleas prefer to feed on women rather than on men. Therefore women who have to work in basements are usually

the first to notice an infestation of a building because the basement may have openings leading into the building and offer suitable hiding places.

Disease: The flea is accredited with an important role in public health because of the part that it plays in the dissemination of plague. This disease is transmitted from the rat to the human being by means of the flea, either through the bite or the excrement. Fleas have been also found responsible for the transmission of other diseases, but it will suffice to say that they are a potential public health hazard, and definite destructive measures should be employed at all times.

Control: Numerous remedies have been recommended for ridding houses and animal pets of these pests, but these remedies have not proved entirely effective.

Mechanical Remedies: Thorough sweeping and cleaning of floors and walls, the disuse of carpets and mattings, and the replacement with rugs which can be removed and cleaned at frequent intervals prove quite effective. Infested carpets and other such objects should be dusted with pyrethrum powder or sprinkled with benzine. Failing in these methods, the removal of all carpets and thorough scrubbing with hot soap suds are recommended. One of the most effective mechanical means for destroying these pests is the use of the vacuum cleaner.

Powders: Fresh pyrethrum powder is effective in killing fleas on cats and dogs, by scat-

tering a teaspoonful of the powder along the back of the animal and gently rubbing it in. This powder is non-poisonous to humans and animals.

Solutions: The thorough washing of infested animals with a kerosene solution is a cheap and satisfactory method of destroying fleas. Five gallons of this emulsion may be made as follows:

Dissolve two ounces of liquid washing soap in one quart of hot water. Bring to a boil, remove from the fire and add two and one-half pints of kerosene. Agitate the mixture violently with an egg beater. Add water to make five gallons. It should be kept in mind that free kerosene will burn animals. If any separation of the oil takes place in the mixture, it should be reheated, but care should be exercised to avoid spilling it on the fire or its boiling over. Then the mixture should be agitated again with an egg beater.

The use of this emulsion is not entirely recommended in the household on account of the disagreeable odor and other effects of kerosene.

The skin of cats is much more easily injured with chemicals than that of dogs, so any preparation used should be weaker for cats than for dogs.

Commercial creoline may be purchased at drug stores at a very reasonable price. A three per cent mixture with water may be made as follows:

Four teaspoons of creoline to one quart of water, or four tablespoons to a gallon of

water. This mixture may be applied to animals with the hands or a brush, or the animal may be submerged in the solution for about five minutes. No further care or treatment is necessary after the application. This treatment not only destroys the fleas, but also serves as a deodorant.

In treating floors, it is recommended that all unnecessary objects be removed and that cracks and crevices be scrubbed with a five per cent solution of creoline. For the treatment of dirt floors, coarse salt should be scattered liberally over the surface and then followed by a thorough spraying with water. If fleas develop in lawns the grass should be clipped closely and sprayed with a nicotine sulphate solution, one part to 400 parts of water.

The bedding of animals infested with fleas should be thoroughly saturated from time to time with a five per cent solution of creoline.

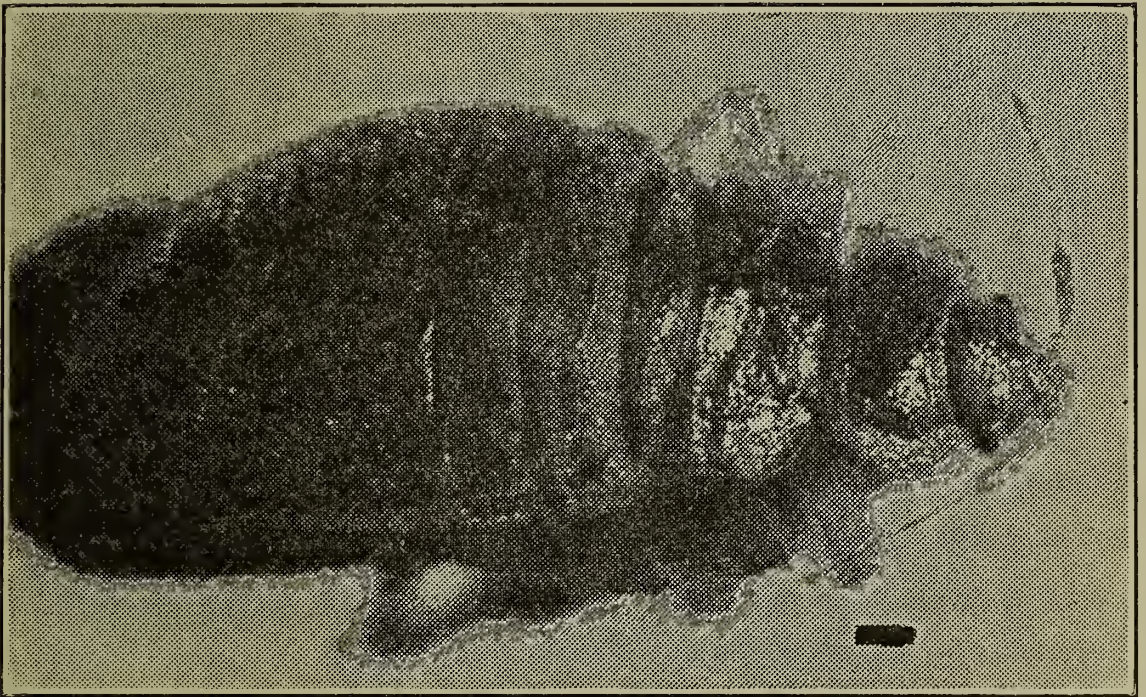
Washing Animals: Work up a heavy ring of soap suds around the animal's neck just below the ears, as the first step in bathing. Keep this ring of suds worked up well during the bathing process. If this procedure is not followed the fleas will crawl to the animals head and remain there until the bath is completed and then re-infest the body.

BEDBUGS

BEDBUGS have been carried by man to practically all parts of the world. Apparently, these pests have always invaded the environments of human habitation. This household pest, like the flea, is very annoying and capable

of inflicting a wound that is irritating to the skin and mentally disturbing.

Because of the presence of bedbugs, one need not feel that this is due to neglect or carelessness. They may gain entrance in spite of all reasonable precautions. For instance, in the case of ships, a boat may be thoroughly cleaned and fumigated so that there is not the slightest sign of insect life aboard, and yet after a week or ten days at sea an infestation of bed-



Bedbug (17x)

NOTE—Spot shows actual BODY size

bugs will be found. This is generally due only to the fact that these insects were brought aboard in luggage of passengers or crew. In like manner, they gain access to premises in materials that may be brought in, such as in laundry or other clothing, in suitcases, trunks, etc.

They are also known to migrate from one house to another, particularly from one apartment to another. They usually gain entrance to homes and rooms by passing along walls, water-pipes, through windows and other openings. Particularly, will they invade new premises if their habitat has been vacated by the host, which of course means a failure of their source of food.

The bedbug is flat, thin and covered with short hairs. The color of the body is reddish brown.

Habits: Normally, this insect is nocturnal in its habits, and especially capable of concealing itself during the daytime, when it hides in cracks in the floor or wall, behind wainscoting or loose wallpaper, in bedsteads, and other such places.

As a rule, it dislikes stone and metal and seems to prefer seams of mattresses, sofas, etc. Metal beds, however, do not guarantee immunity from an invasion of bedbugs.

Bedbugs seem to be able to live for quite a long time without food.

The bedbug exudes a repulsive odor.

Danger to Public Health: Aside from being an annoying pest, the bedbug is regarded as a potential public health menace. It has been suspected of being an intermediate host in the transfer of many communicable infections.

Control: In the control of bedbugs it must be remembered that their nocturnal habit of feeding; hiding in the daytime in a place foreign to that in which their feeding occurs, will

require patient searching for the location of the infestation. For example, a person may be annoyed by the insect in a bed that is occupied each night, and the bug itself may be infesting and making its habitat in an unused bed, chair, cot, or other piece of furniture that may not be suspected. For this reason people often wonder just how the infestation is occurring, particularly when they actually catch and kill an insect but can find no further insects in the bed they are occupying.

The characteristic odor of bedbugs is one means of tracing infestation. The debris usually left by the bugs, such as the skin that has been shed, is another means of locating the insect.

Undoubtedly, one of the most effective means for the extermination of bedbugs is fumigation of home or rooms with hydrocyanic-acid gas, but this is not permitted in San Francisco except when done by a licensed fumigator under the direct supervision of the Department of Public Health, and should only be employed when the infestation is very serious and other means of destruction have failed.

The fumes produced by burning sulphur are effective in destroying this pest in all stages of development. Care must be exercised in using this material as it can readily cause damage to household furnishings due to the strong bleaching properties. Sulphur candles are readily obtainable in most drug stores and are preferable as a source of sulphur fumes. Premises to be fumigated with sulphur should be

definitely dry; expensive fabrics and metal surfaces should be removed. The latter may be coated with vaseline if it is not practical to remove them from the area. The space to be fumigated should first be thoroughly sealed to prevent escape of gas to outer spaces. Use two pounds of sulphur per 2,000 cubic feet of space. The gas should be held within the space at **least** six hours, preferably twenty-four. The container of burning sulphur should be set in a receptacle holding water and this should be wide enough to catch the possible overflow of burning sulphur. Thoroughly air the premises after fumigation.

Whenever it is obvious that the infestation is confined to removable furnishings such as studio couches, overstuffed furniture, mattresses or other bedding, it is advisable to send the infested pieces to a reputable firm engaged in furniture sterilization or fumigation.

FUMIGATION OF ANY NATURE IS NOT RECOMMENDED FOR PERSONS INEXPERIENCED IN THIS WORK.

Elimination of hiding places is one of the important factors in control. Loose baseboards, picture mouldings, loose joints, seams, cracks, faulty floors, loose wallpaper, open areas around pipe openings, are all items that should be properly repaired whenever an infestation is noticeable and control measures are to be instituted.

The application of benzine, kerosene, or other lighter petroleum oils by means of a brush, feather or spray is efficacious **BUT** be mindful of the **FIRE HAZARD**. Scalding hot

water or soap suds are very effective whenever practical.

Daily inspection of bedding, particularly of the tufts and seams of mattresses is recommended in hotels, hotel apartments, and furnished rooms.

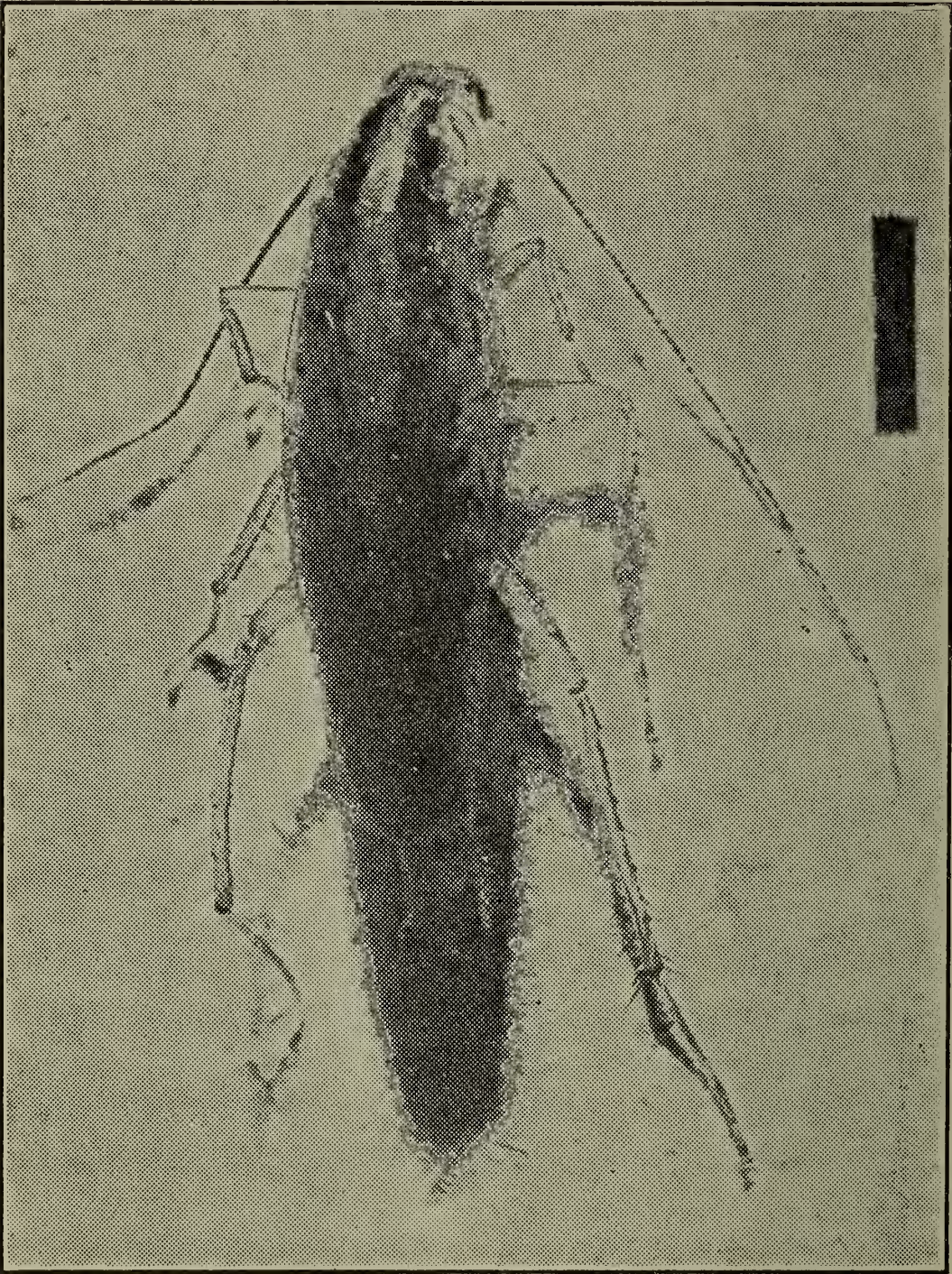
Whenever an infestation of the vermin is discovered and a proper, vigorous campaign of extermination is carried on, the complete eradication should be accomplished in one week; if this is not accomplished then you are not carrying out the work properly or the means of ingress has not been blocked off.

ROACHES

Roaches are one of the most common, repulsive, destructive and offensive insects that invade human habitation. The large number of species would require too much space to discuss individually. Therefore, the information herein is general but applicable to all that are usually encountered in the home.

The term "cock" roach is common and generally given to this insect by most people. It is usually mentioned in descriptions of foul undesirable places, and is sometimes mentioned as a sprinter in impromptu races for the amusement of some who seem to have little else to do. It has also been referred to as a pack horse in jails for the transportation of cigarettes, notes, etc., from one cell to another. This latter alleged accomplishment is the result of efforts to describe the unusual size of the insects supposedly found in such

places and to discredit the sanitary efforts of custodians of the bastile.



Cockroach (4x)

NOTE—Spot shows actual BODY size

Habits: Roaches are nocturnal in their habits and retire to secluded, dark places through cracks and other openings, and remain

inactive during the daytime. They are smooth, slippery insects, rather uniformly dark in color and broad and flat in shape. The males generally have two pairs of wings, the outer of which appear tough and leathery; the inner, soft and tissue-like. The females are nearly wingless in the adult stages. They have long, powerful legs which are armed with strong bristles.

House roaches gather in kitchens and pantries and are especially fond of warm places. Steam pipes and the vicinity of furnaces and other sources of heat are favorable nesting places and runways. Because of their ability to conceal themselves their numbers are sometimes not realized, and very frequently the housewife is not aware of an infestation until she has cause to light up the kitchen or pantry, and surprises them in their foraging or feasting.

The roach gives off a distinct nauseous odor due to excrement and a dark-colored liquid exuded from the mouth. This odor persists and can only be successfully removed by scrubbing befouled places with boiling water and soap.

Roaches occasionally migrate, which is the reason for invasion of new homes.

Diet: Household roaches are not particular in their feeding. They will eat all types of food and dead animal matter, and sometimes gnaw woolens and leather. They soil practically everything with which they come in contact—food so damaged is beyond redemption.

Danger to Public Health: The roach has possibilities of carrying disease mechanically when it is considered that it feeds on all food-stuffs and migrates from one section to another—from sick room to kitchen, to lavatories, etc. They are potential health hazards because of their ability to disseminate infection.

Control: Scrupulous cleanliness and proper protection of foodstuffs are of importance in control and suppression.

Roaches may be controlled by trapping, poisons, fumigants and repellents.

Hydrocyanic-acid gas is completely effective, but again caution is necessary. The use of this material is only permissible in San Francisco under direct supervision of the Health Department and by a licensed fumigator.

Sodium fluoride is very effective against roaches. Dusting by means of a blower or dust gun will destroy great numbers of the pests. Again a word of warning—sodium fluoride is poisonous to humans; be extremely careful in the use of this material around foodstuffs.

Powdered borax has also been used effectively in the extermination of roaches.

The free use of a mixture of one part powdered borax to three parts of finely ground chocolate is recommended.

Use of pyrethrum powder is a temporary expedient, but not entirely effective.

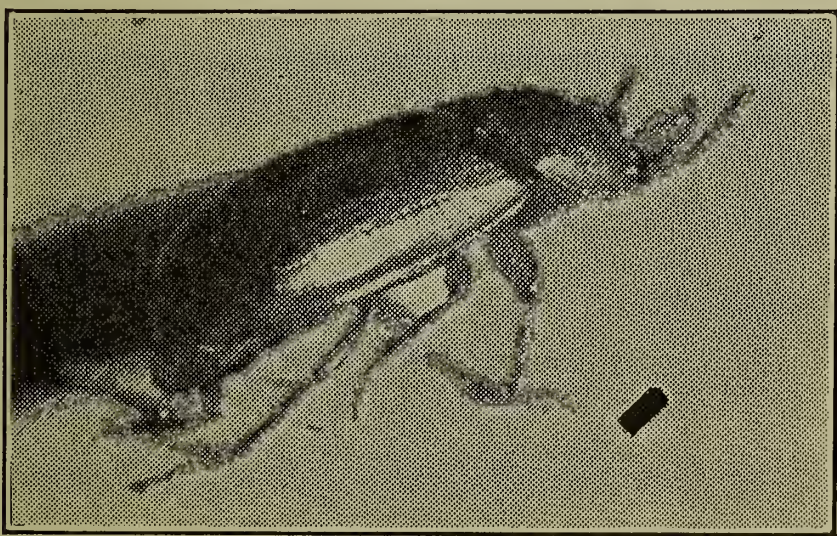
Flowers of sulphur dusted about will serve as a repellent.

Deep-mouthed basins, dishes, or other receptacles may be used as traps. A bait of stale beer or ale in the bottom is best for these traps. Sticks are placed as runways leading up and over the rim of the receptacle, allowing the roach to enter and pass down the smooth inner surface of the receptacle.

Remember, roaches may be brought into premises in groceries, laundry, etc., or they may be migrating from adjoining premises. Determine and eliminate means of ingress as well as local hiding places.

WEEVILS

Weevils are more of an economical problem in certain food industries than a household pest. There are times, however, when a small



Weevil (9x)

NOTE—Spot shows actual BODY size

but annoying infestation occurs in the home and may prove to be very persistent.

There are numerous types of weevils, the most commonly encountered in the home being

the granary and rice weevils. Both are brown or black with a shiny snout.

Entrance to homes is usually by way of packages of groceries. Sometimes an article of food that is not frequently used by the housewife is stored in a portion of a pantry or food cabinet. From this package, which may have contained weevils when brought into the home, the infestation spreads to other sections of the storage space.

Control: Locate and remove the main source of infestation. If some of the pests have found their way into inaccessible places, such as behind drawers, in cracks in the wood, etc., the following may be definitely effective:

Place a saucer containing carbon disulphid into the cupboard. Carbon disulphid is inflammable and should be kept away from flame. It will have no ill effect upon the foodstuffs.

However, weevils have no public health significance.

LICE

The words "louse", "lousy" and "lousiness" are common slang terms used as descriptive adjectives of something exceptionally poor in quality or offensive. The small vermin from whose name these phrases originate is in every respect deserving of the repulsive attributes.

The presence of lice upon the person of one member of the family may readily result in others becoming infested, but this does not necessarily indicate unclean conditions in the home. Clean individuals often become infested while at work, in school, or other such places

of congregation, or during recreational pursuits.

On the other hand, recurrent infestation of individuals from the same premises wherein the same group congregate is indeed a definite indication of insanitary conditions and lack of proper personal hygiene.

Danger to Public Health: Lice are very definitely a potential public health hazard and have on various occasions played the leading role in dissemination of disease in wide-spread, drastic epidemics of typhus fever.

This vermin transmits disease to man by means of the excreta which has befouled the punctured wound made by feeding, or self-inoculated as the result of scratching.

Habits: Human lice are classified as follows: body lice, head lice and pubic lice.

BODY or CLOTHES LICE are sometimes referred to as the "greyback" and during the World War were dubbed "cooties." The latter name seems to have been more generally accepted by our American public than any other nickname ever given to the vermin.

Habits: This parasite is dependent upon human blood for sustenance. The body and clothes of human beings afford the means of life and reproduction to the louse.

The eggs or nits are laid on fibers of clothing or the hair of the body. Rough materials such as woolens, flannels, and felt afford a generally preferred depository for eggs. Ordinarily, the eggs hatch in about eight or nine days at the temperature normally existing between body and clothing.

Vermin infestation is spread by personal contact, by clothing or other personal effects. In the case of the louse, make it a **STRICT RULE NEVER** to use another's comb or brush. One vermin-infested individual may spread the infestation to many.

Lice keep fairly close to one host and are not usually found in bedding or mattresses, nor in the furnishings of rooms. For this reason, it is apparent that generally unsanitary premises are not likely to be responsible for a person becoming lousy **UNLESS** these same premises were badly over-crowded, causing exceptionally close contact of individuals and their clothing. Persons may become infested by immediately occupying a room or bed recently vacated by a vermin-infested individual.

Lice are generally found in the clothing worn close to the body, but may be found on any article of clothing of an infested person.

Delousing: It is a comparatively simple matter to kill lice and their eggs. The methods usually followed consist of heat, chemicals and storage.

Heat may be applied by numerous methods—boiling water, steam, ironing, ovens, and very effectively by **FLAME** applied to infested clothing. The latter method is the proper one to assure protection of clothing and premises of those who must attend individuals who have permitted themselves to become heavily infested with the vermin. It is not uncommon to encounter cases in Emergency Hospitals of the San Francisco Department of Public Health where the individual must be

immersed in a bath of disinfectant. When such cases are handled, the ambulance, the hospital and the clothing of personnel are in danger of infestation—hence burning of all of the patient's clothing is a comparatively inexpensive precaution.

Dry Heat is effective on a small scale. Ironing clothes is also a simple procedure in the event of a single infestation involving a small number of the vermin. Hot ovens have also been used successfully in this connection.

Steam is one of the most commonly used methods of heat in delousing, and is of value in large scale operations as in military camps.

Immersion of clothes in boiling water is a simple delousing method that can be readily employed in all households.

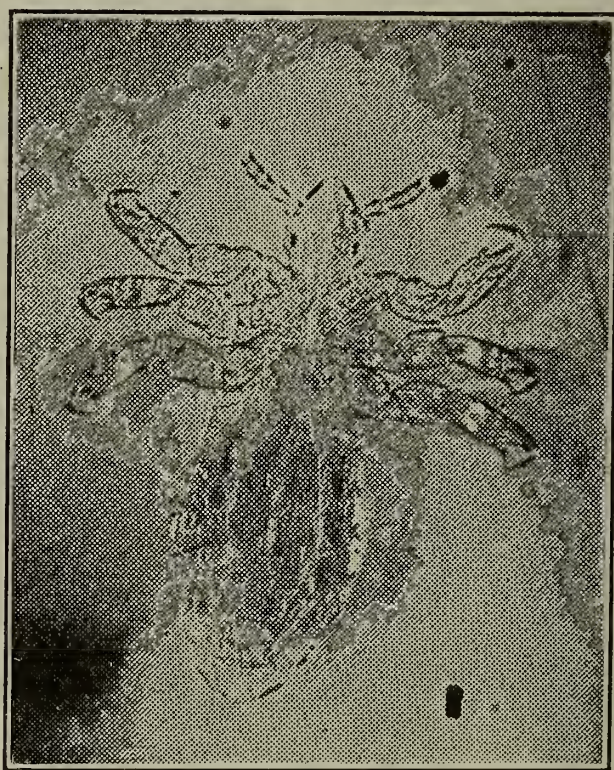
DO NOT send clothing of persons infested with lice to laundries or dry cleaning establishments unless the tradesman receiving same has been warned and the clothes have been placed in a closed container.

The **HEAD LOUSE** is perhaps the most common variety encountered in the home. It is found mostly in children, particularly in girls because of the long hair. Spread of the insect is by contact such as occurs in schools, and by common use of hat racks, brushes, combs, and exchange of head covering.

Parents of children that have become infested with head lice should never remain silent on the subject, nor should they cast undue criticism upon the school that the children are attending. In spite of utmost precautions on the part of school and health authorities,

such cases will occur from time to time. In this respect it is well to be mindful of the adage: "It is no sin to have them, but it is a sin to keep them."

Immediately report an incident to the principal of the school or directly to the Department of Public Health. This will result in prompt and thorough investigation of the facts and elimination of re-infestation, and prevention of further cases.



Head louse (17x)

NOTE—Spot shows actual BODY size

Delousing: The proper removal of head lice and eggs (nits) sometimes requires patience. Parents may become suspicious of this trouble in their children due to signs of scalp irritation. Confirmation is easily made by looking

for the eggs (nits), which are small white objects adhering to the hair.

In the case of boys, removal of the hair is a simple expedient. Most boys of school age frequently enjoy a close haircut, particularly in the summer months.

Living parasites may be effectively destroyed by anointing the head with a mixture of equal parts of kerosene and olive oil, or kerosene and vinegar; the head should be wrapped in a towel and given a thorough shampoo with hot water and soap in an hour or two. This procedure may have to be repeated several times to assure complete cleansing.

Combing with a fine-toothed comb wet with vinegar or alcohol will aid in removing nits.

All articles used should be carefully washed and disinfected. Children should always be provided with individual combs and brushes.

PUBIC or "CRAB" LICE. This insect resembles a crab and may be encountered in lodging houses, obtained from bath tubs or toilet seats. The latter has on many occasions been responsible for the transfer of this insect from one person to another in occupational environment.

Whenever a member of a family has become infested with this pest, every precaution should be taken to protect everyone in the home from similar exposure.

At times serious infestations occur in industries employing a large number of people. Such occurrences are most always the responsibility of one individual and sometimes such unfortunate incidents practically disrupt an entire

business. Employees who have become infested might immediately tend to their infestation and rid themselves completely of the vermin only to return to their employment to be re-infested.

When such an incident occurs, the obvious responsibility of the management is to curb the infestation at once. Toilet seats and surroundings should be treated several times daily with strong disinfectants of decided insecticidal value. All toilet seats should be re-



Crab louse (17x)

NOTE—Spot shows actual BODY size

painted or re-varnished. If re-infestations continue to occur, those in charge should call a meeting of employees and confront all with the importance of proper care of themselves. Importance of responsibility should be definitely impressed upon them and the consideration due fellow-employees should be stressed.

Delousing: Pubic or “crab” lice adhere very determinedly to the skin, and feed prac-

tically continuously. The nits are laid at the base of the hairs of the body and may be found on almost any part of the body. The nits are usually found, however, in the pubic and perianal region, over the abdomen and chest.

Shaving is very effective. The use of specific ointment or other such material is of value but may cause skin irritation and should be used with caution and on the advice of a physician.

MOTHS

HOUSE MOTHS are not of public health importance but certain poisons used in extermination are. Moths are a very definite, serious, economical household pest and annoying to say the least.

The San Francisco Department of Public Health is called quite frequently for information relating to destruction of moths. Because of this, there is imparted herein some well established facts and authentic information on the subject.

Habits: The common clothes moth seldom flies directly to a light as do many other moths that enter houses from outside. They conceal themselves in cracks, in the creases of clothing, and other dark places. Contrary to common belief, the house moth does not eat fabrics. They lay eggs that develop into worms or larvae which alone cause the damage. The larvae are usually found in carpets and rugs, covering of upholstered furniture, tapestries, stuffed birds or animals, the felt in pianos and numerous other articles.

Control: In this respect, it is advisable to consider the fact that one single piece of infested furniture may keep a house constantly infested for years. Articles of clothing in general use and those carefully brushed several times each month are seldom damaged. On the other hand, furniture even if constantly used may be heavily infested. Before storing fabrics they should be carefully cleaned and brushed and sprinkled with naphthalene or other such crystals and then wrapped tightly in paper.

Frequent brushing and sunning of articles subject to moth damage is one way of efficiently preventing destruction.

Vigorous brushing of both sides of carpets and rugs, and the use of a vacuum cleaner are simple, effective mechanical means of moth control.

Several very effective methods may be employed in treating furniture that has become moth infested—such as fumigation, heat or cold, or a combination of fumigation and heat. This type of work is usually best done by a commercial establishment engaged in such practice and necessitates removal of the furniture from the home.

Moth-proof bags of paper or other materials are inexpensive and afford excellent protection. Care must be exercised, however, to prevent rents or tears in these containers.

Red cedar chests tightly constructed are definitely of value in protecting fabrics from moths. Closets lined with red cedar are very desirable, but one must not depend implicitly

on this protection, and materials stored therein should be inspected and brushed at regular intervals.

Moth-proofing solutions are available. Certain of these products when properly applied will afford protection for a limited length of time. There are some of these compounds, however, that are of little or no value. Various firms applying moth-proof materials will guarantee such to be effective for three to four years.

Investigations by the United States Department of Agriculture indicate that there are no solutions available that will render fabrics absolutely and permanently immune to moths.

Moth-proofing solutions, and fabrics treated with them, are to be handled carefully in the home. Children should be especially cautioned.

BEETLES

There are at least one-quarter million species of beetles—two of every five insects belong to this order. Beetles are encountered in practically all climates and many are household pests. Obviously, complete discussion here is impossible; however, a limited number will be mentioned.

DRUG STORE BEETLE. This beetle derives its name from its habit of eating all kinds of dried plants, such as are found in drug stores. Dried beans and breakfast foods are also part of this beetle's diet.

FLOUR BEETLE. These small reddish brown insects are often found in flour. It is found world-wide in mills, food stores and kitchens.

Control: Cereal stock in homes should be kept at a minimum and should not be allowed to remain in food lockers until it becomes stale. Such foodstuffs should be kept in dry storage spaces and in tightly covered containers, preferably tin. Infested cereals in homes should be destroyed. All shelves, corners, cracks, and crevices of infested closets should be cleaned with hot lye water, using every precaution.

Other Beetles: Checkered Beetle, Ham Beetle, Real Stink Beetle, Saw-toothed Grain Beetle, Square-necked Grain Beetle, Dried Fruit Beetle, Ladybeetle, Cadelle, Common Larder Beetle, Black Carpet Beetle, Buffalo Beetle, Cabinet Beetle, Furniture Carpet Beetle, Common Carpet Beetle, Museum Beetle, Pompbeetle, Powder Post Beetle, Hide Beetle, Tissue Paper Bug, Knock Beetle, Tobacco Beetle, Spider Beetle, Brass Beetle, Hump Beetle, Wharfborer, Darkling Beetle, Bean and Pea Beetle, and Barkbeetle are some of the varieties commonly encountered.

CRICKETS

CRICKETS may become annoying household pests at times and are mentioned because of occasional invasions of premises during warm seasons.

HOUSE CRICKET. The house cricket lives in chimneys, cellars and other warm, slightly damp places. The cricket cannot fly far, can walk rapidly and can jump with surprising activity. Its characteristic singing or chirping

is produced by rapid rubbing together of the upper pair of wings.

The **FIELD CRICKET** is an outdoor pest, but likes to hibernate in buildings. Serious infestations of houses do sometimes occur by means of entrance through cellars, cracks, windows and doors. They will eat paper, cloth, linen, cotton, silk, furs, etc. At dusk they swarm—covering roads, poles, sidewalks, walls, floors, and may enter automobiles and cover clothes and other objects therein. They eat and spoil foods and textiles.

Control: Natural enemies take a great toll of crickets each year. Chickens and turkeys feed upon them. Methods suggested for roach control are effective in cricket extermination. (See chapter on Roaches.)

BEES, WASPS, HORNETS

These are considered household or garden pests only because of the seriousness of their sting and interference with free use of property.

BEES are a nuisance only when they swarm too closely to premises for comfort of inhabitants. A beekeeper is always willing to remove a swarm of bees. Poisonous baits may be used, but the honey from these bees should be destroyed. Liquid sprays are also effective.

WASPS and **HORNETS** as a rule live in large colonies. They sometimes enter houses in the late fall in search of shelter.

Nests are made of paper-like material. Earth wasps construct tunnels or build mud nests.

Control: Any attempt at controlling these insects should be given careful consideration and definite plans of attack should be decided upon before undertaking the task.

Disastrous results from serious stinging may be the outcome from abortive attempts at destruction.

Nests constructed in gardens or buildings should be closely observed in the daytime. At night after all the insects are in the nest, the entrance hole may be plugged with a cotton wad thoroughly soaked with chloroform or benzol. The nest may then be cut down, placed in a container having a tight-fitting cover, and allowed to remain until the next day.

Another simple method is to hold a bucket of water filled to the brim close to the nest so that the entrance hole is submerged below the surface and then cut the nest away with a long sharp knife, allowing it to drop into the water. Cover the bucket with a sack and allow to remain over night.

Hornets' nests in the ground may be destroyed by pouring a half-cup of carbon tetrachlorid or carbon disulphid into the entrance and covering it with a wet sack. This, too, should be done at night after all are in the nest.

The use of fire to burn out nests is inadvisable around the home.

MOSQUITOES

MOSQUITOES are small two-winged insects belonging to the order Diptera. Thousands of species are known and classified in many fami-

lies and genera. It is assumed that those who will be served by this reference are familiar with adult mosquitoes and the discomfort and possible disease resulting from their presence.

Mosquitoes are man's inveterate tormentors and some are dangerous enemies. Mosquitoes are recognized in transmission of malaria, yellow fever, dengue, and filariasis. In addition thereto, the common non-disease-producing mosquito is sometimes responsible for infections brought about by individuals yielding to the irresistible impulse to rub and thus infect the skin where a mosquito has bitten.

Briefly, the disease-producing mosquito is not a public health factor in San Francisco.

Habits: Mosquitoes pass through four stages: egg, larva, pupa and winged adult—the first three being aquatic.

(1) **Eggs** are laid upon the surface of water or soft mud. They float separately in the case of the malaria-bearing (Anopheline), and in rafts or boat-shaped masses in the case of the non-malaria bearing (Culicine). In a day or two, under favorable conditions, the eggs hatch out into larvae or "wiggle tails".

(2) **Larva** of the malaria mosquito vector is strikingly different in contrast with other species. The head is very small and the body lies parallel to, and just below the surface of, the water. The larva of the pest varieties will be seen hanging just beneath the surface of the water, head down, body at an angle of about 45 degrees. Mosquito larvae are true air breathers; obviously, if deprived of their sup-

ply of air they will drown. Therefore, there is no mosquito breeding in the main areas of ponds, lakes and other large bodies of water whose surface is subjected to considerable wave action.

(3) **Pupae** assume a form similar to a question mark and dart about with a peculiar, quick, tumbling movement—thus its common name “tumbler”. This stage usually lasts from one to two days.

(4) **Adult**—The female of the species is the biting pest—males never bite. The malarial type mosquito may be readily distinguished by the position assumed while biting. The biting part (proboscis) and the length of the body are in line with each other, and the insect looks like a straight slender splinter, supported by the legs at an angle of about 45 degrees to the surface upon which the insect is resting. Ordinary mosquitoes under similar circumstances have the biting part bent at an angle, the body being more or less parallel to the surface upon which the insect is resting. Malaria mosquitoes have spotted wings, which are unusual in other type mosquitoes. Development from egg to adult requires a minimum period of eight days or longer, depending on temperature, moisture, etc. The male lives for three or four days, while the female lives on an average of 35 to 40 days during the summer. The female malarial mosquito may, however, hibernate for several months during the winter, appearing in the spring to propagate the species.

Any collection of water near houses may be a potential breeding place. Thus they have been found in discarded tin cans, broken crockery, bottles, on garbage heaps, in buckets, tubs, barrels, cisterns, wells, baptismal fonts, depressions on roofs, clogged gutters, ditches, cesspools, sewers, sewer sumps, catch basins, fire buckets, fishless fish ponds, etc. Mosquitoes never breed in damp grass, weeds, or bushes.

The biting habits of mosquitoes vary—some species will bite during the day and at dusk, while others bite at dusk and during the night.

Abatement: Abatement measures aimed at the destruction of mosquitoes fall into two classes: (1) those against egg, larva and pupa; (2) those directed against the winged insect.

As a rule, mosquitoes do not travel a great distance from their breeding place. This is particularly true of the common house mosquito, *Culex pipiens*.

When the peace and quiet of the home is disturbed by the presence of mosquitoes, do not take them as a matter of fact or blame some distant location for their presence. Immediately start careful, methodical search of your own premises for possible breeding places. **FIRST**, see that there is no stagnant water in or near the house. **SECONDLY**, be sure your fish pond is stocked with surface-feeding fish.

Light oils such as kerosene spread upon the surface of water that cannot be filled or drained will not only cut off the oxygen supply, but also have a toxic effect on the larvae. Be sure that the whole surface is covered with oil. Two tablespoons of oil will cover an area

of 15 square feet. The oil evaporates readily and during summer once-a-week treatment is essential to prevent breeding. Two parts castor oil to 100 of kerosene will help the surface film to last longer, and seems to spread easier.

Screening the house by using metal screens of 20 strands to the inch mesh will reduce possibilities of invasion. Mosquito netting or "bar" properly draped around the bed reduces the chance of being bitten while asleep, although the mosquito has little trouble biting if the sleeper rests against the protective covering. If mosquitoes become noticeable in the bedroom at night, be sure to make careful search for them the next day and destroy them wherever found.

Repellents are only partially effective and too much should not be expected of them. As a matter of fact people are frequently heard remarking that certain so-called repellents seemed to attract rather than repel mosquitoes. Volatile substances such as oil of camphor, oil of peppermint, lemon juice, or vinegar rubbed on the hands and face, or a few drops on the pillow, will keep mosquitoes away, but only for a time. Oil of citronella is also good. All of these substances lose their efficiency—none last until morning.

WARNING is given against scratching the bites of mosquitoes, as this leads to localized infections.

DON'T SCRATCH (it's not polite)—apply cold cream, baking soda solution, ammonia solution, spirits of camphor, camphorated oil or tincture of iodine.

SPARROWS—WILD PIGEONS—SEAGULLS

These might seem out of place in this manual, but must be given brief mention from the standpoint of their nuisance value only.

SPARROWS serve no useful purpose; they nest close to human habitation. Besides the damage they do in the garden, they soil homes and drive away other useful birds. The sparrows' nests are made of feathers and hairs, and harbor moths.

Prevention: Prevention methods should include destruction of nests and desirable nesting places. Everything that may serve a sparrow as food should be kept out of reach. Trapping is effective.

WILD PIGEONS form groups and keep to certain neighborhoods. They may become a nuisance because of the excreta and the noise. The so-called poetical cooing may readily become cause for irate action by neighbors.

In many orderly cities this bird causes considerable expense in repairs and cleaning. Its excrement is annoying to pedestrians and the salts and acids formed during the rotting of the excrement wear away certain metals and stones.

The pigeon nests in ornaments on churches and buildings. Its nest draws rats, its excreta draws flies, and flies breed in its nesting place. The pigeon carries and spreads bugs, lice, mites and ticks.

Prevention: Owls and hawks are natural enemies of the pigeon and it would be a pleasure to have certain of these make inroads

on the pigeon population in certain heavily infested sections of our city. The number of pigeons gathered in various sections require gradual elimination and the practice of the sentimental pigeon-protector and feeder should be controlled. These latter individuals never feed or encourage habitation of pigeons in the vicinity of their homes, but are very active in the vicinity of public squares, buildings and other people's property.

Shooting and the use of poisons are not practical or permissible within the city limits. Various traps, particularly snares are of value.

SEAGULLS have a nuisance value when away from their natural habitat. This bird normally remains in aquatic areas, but is readily enticed inland by a plentiful food supply. Its excreta, like that of pigeons, is a destructive nuisance.

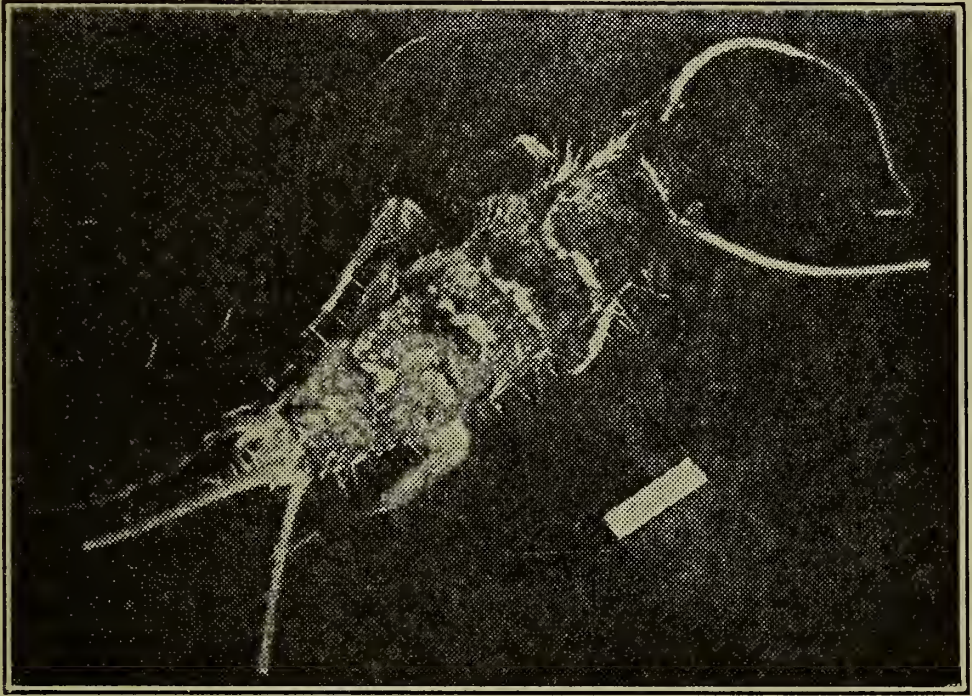
Their noisy clatter and squawking is a disturbing factor. Some people have developed the habit of attracting these birds to residential areas by feeding them at regular intervals. They readily become accustomed to such practices and arrive daily in increasing numbers as early as an hour before feeding time. They are very patient and seem to be able to keep themselves occupied while waiting, and at the same time cause nuisances and definite property damage.

Seagulls are an asset in helping to keep beaches and waterways clean. They are protected and it is a violation of the law to harm them. There is only one way to keep them

from becoming a nuisance and that is to leave them in their natural habitat. Do not feed them at home.

SILVERFISH

SILVERFISH are household, apartment house and hotel pests, particularly the latter.



Silverfish (5x)

NOTE—Spot shows actual BODY size

Habits: The silverfish is a glistening, silver, or pearl-gray insect with three long tail-like appendages. The outer surface resembles the scaly exterior of a fish. The manner in which these scales refract the light gives the silverfish the translucent appearance of pearl. The movements of the flexible silverfish body are fast and supple, like the movements of a fish in water.

The silverfish glides quickly out of sight when the dark recesses made by books, cloth-

ing, etc., are moved, exposing them to light. This insect is adept at dodging and when in contact with the fingers the shiny body easily slips from the grasp. Silverfish dislike light and their hiding places are usually discovered only when trunks, books and other such household articles are moved. They prefer warm places, and are often found around steam radiators in apartments and hotels.

Silverfish cause damage to starchy materials, paper, chocolate, wool, silk, leather, photographic plates, artificial silk, rayon and lisle.

Control: Silverfish can be controlled by removing their hiding and breeding places, cracks, crevices, dark spots and other such conditions attractive to the insect.

By taking advantage of the natural craving of the silverfish for starchy food, they can be poisoned by using stomach insecticides. A powder mixture of 12 parts sodium fluoride to 100 parts of wheat flour is effective. A paste may be made by mixing from $\frac{1}{2}$ to $\frac{3}{4}$ of an ounce of white arsenic with one pint of wheat flour and adding enough water to make a thin paste by boiling. **EXERCISE CARE IN HANDLING ARSENIC AND FLUORIDE.** The paste should be poured on small pieces of flexible cardboard or paper which can be readily rolled into cylinders with the paste on the inside. The powder or paste should be placed where silverfish are found—as behind books, shelves, under washboards, on the bottom of drawers, in storage boxes, and behind mantels. The powder and paste are **BOTH**

POISONOUS TO HUMANS and should be placed where young children and household pets will not find them.

Pyrethrum dusted upon bookshelves, or on other places where it can be used, is of value; but it must be renewed often for it loses its strength after long exposure to air.

SPIDERS

SPIDERS when present in houses often become a nuisance and their webs present an unsightly appearance. Certain species of spiders are beneficial as they are the natural enemies of many injurious pests and do a rather good job in destroying them. This is possibly the reason for the superstition that it is bad luck to kill a spider.

Control: Destroy webs in cellars and attics by using a cloth-covered broom and brushing crevices, joists, etc. Kerosene spray is also effective, but should be used with caution because of fire hazard.

Black Widow: This lady (if she can be called such) is a poisonous species of spider, capable of causing severe pain and possibly death by her sting.

Habits: The black widow is a sleek all-black insect with a distinct red marking on the underside. The red markings are two small triangular-shaped patches resembling an hour-glass.

The spider prefers dark damp places under logs, rocks, tin cans, under eaves of roofs and in out-houses. Indoors the spider will be found around water and gas meters, under basement

woodpiles, under steps and porches and in the dark corners of basement joists.

This spider is not uncommon from Canada to Argentina. It has received much more publicity than it deserves, the result being that housewives and others have become fearful to approach close enough to kill the insect when encountered. This should not be—the spider is quick but cannot jump and attack as a rattlesnake, but may be approached with perfect safety to crush with the shoe, a stick, broom or other weapon. Kill this insect and destroy its webs whenever you encounter them.

The black widow is timid, shy and retiring. Its common name is derived from the ebony black color and the fact that it kills its mate and the male offsprings. This spider will bite only when cornered and escape seems impossible.

It can live for weeks without food; becomes very sluggish in cold weather; is capable of fighting with other insects but will promptly retire when being overcome; is definitely cannibalistic; spins her irregular web and then waits for insects to become enmeshed; then rushes in and, like a cowboy throwing a lariat, lassoes the victim with a thread-like sticky substance, thrown with accuracy by the two hind legs. Only after the victim is securely roped and practically unable to move is the kill made, and then the spider feeds at leisure on the carcass.

When really hungry, they have been known to attack and successfully kill tarantulas fifty times their size and weight. This was seen in

an enclosed area where a tarantula was placed into a jar with a black widow that had no food for three weeks. When the tarantula entered, the spider immediately climbed to the top of the jar and carefully maneuvered into position and then dopped directly onto the center of the tarantula's back, immediately obtaining a death grip with all eight legs and at the same time biting and injecting its poison. The tarantula began all sorts of gyrations, and reminded one of a bucking bronco trying to rid itself of a persistent rider. Soon the spider, apparently satisfied that her deadly work had been done, retreated to the upper web and patiently remained at a safe distance and waited for her poison to take effect. Gradually the tarantula became drowsy and seemed to be paralyzed. At this stage the widow slowly but surely roped all the tarantula's legs from a safe distance until it was securely tied. Only then did the black widow dash in for the kill and a leisurely dinner.

Control: The same mechanical means described for destruction of other spiders are effective. (See page 59.)

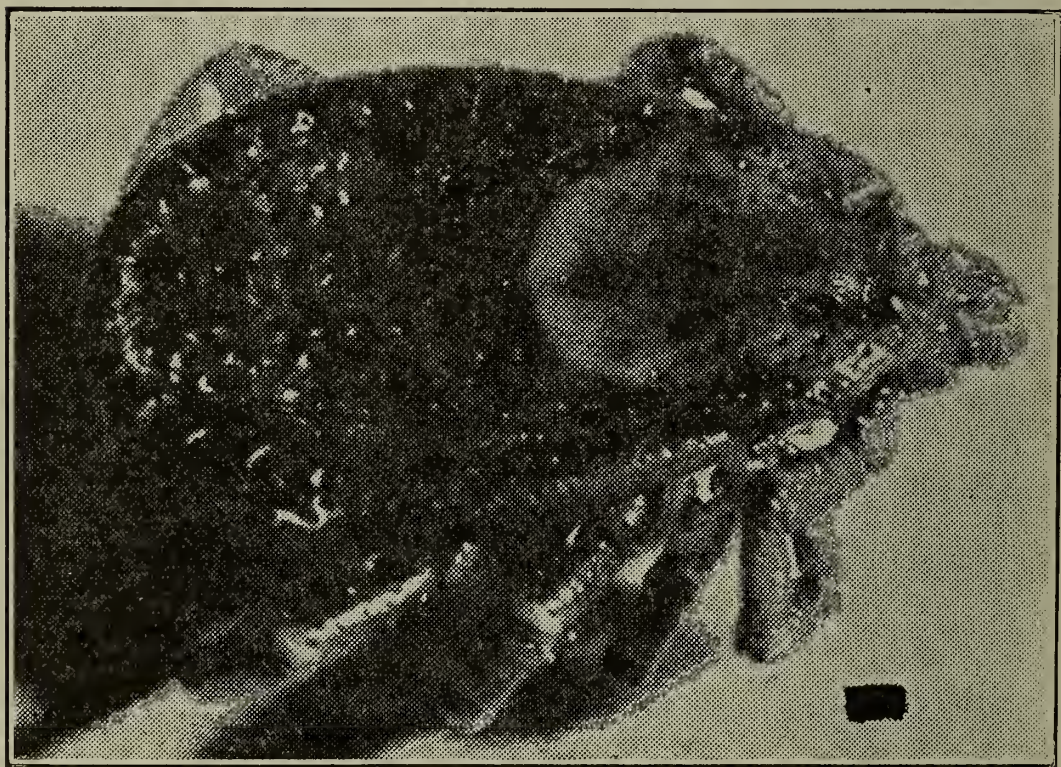
The black widow seems to be a bit more resistant to kerosene and other such sprays, but they are good repellents nevertheless. One part kerosene to one part alcohol is apparently more effective than kerosene alone.

When the egg sacs of the black widow spider are found they should be collected and destroyed. The egg sacs are conspicuous, measuring $\frac{1}{2}$ to $\frac{5}{8}$ inch in diameter, are usually

oval and may be either white or buff colored. Care should be exercised when removing the sacs since the adult female spider may be close at hand.

TICKS

TICKS can hardly be classified as household or garden pests, but are important for the part that they play in the transmission of some diseases, and are not uncommonly encountered by our citizens while week-ending or vacationing in rural areas.



Tick (17x)

NOTE—Spot shows actual BODY size

Habits: Different species attack man. In some of their habits they resemble bedbugs. So far as is known, they take no vegetable food, but exist on blood. Ticks are ecto-parasites of man and some animals, and at times

they hang tenaciously to the skin in which they partly bury themselves.

Ticks require two to five years from egg to maturity. They hibernate during the winter season. Sunshine destroys ticks, consequently they desire shady places.

Disease: Rocky Mountain spotted fever, Texas fever, relapsing fever (also called tick fever and seven day fever) are diseases transmitted by ticks. Some ticks leave the host quite frequently, and the infection they draw from one may be transmitted to another, and even to progeny of several generations.

Control: Control measures, of necessity, would have to be on an enormous scale, and even though a substantial reduction of numbers might be obtained the ticks would still survive.

Keeping the human body and domestic animals free of ticks is comparatively a simple matter, especially the former.

Certain arsenical dips are used in control measures in keeping herds of cattle free of ticks.

When out in the woods, hunting, hiking, or fishing, proper dress including knee-length boots are good protection against ticks. Care in choosing a place to rest or camp is also wise. Frequent examination of the body and clothing is essential. DO NOT SCRATCH a portion of the body that has become irritated—it might be a tick and portions of it may remain in the skin. If it is a tick apply a drop or two of kerosene or a thin coat of vaseline.

This will cut off its oxygen supply and it will back out. If dogs or other hairy domestic animals are along, they should be examined quite frequently.

Sulphur ointment is particularly obnoxious to ticks; arsenic and crude oil are poisonous to ticks and may be used by local application. Clearing the land and cultivation are good tick-eradication measures. Vaccines are made from ticks for protection of humans from Rocky Mountain spotted fever.

TERMITES

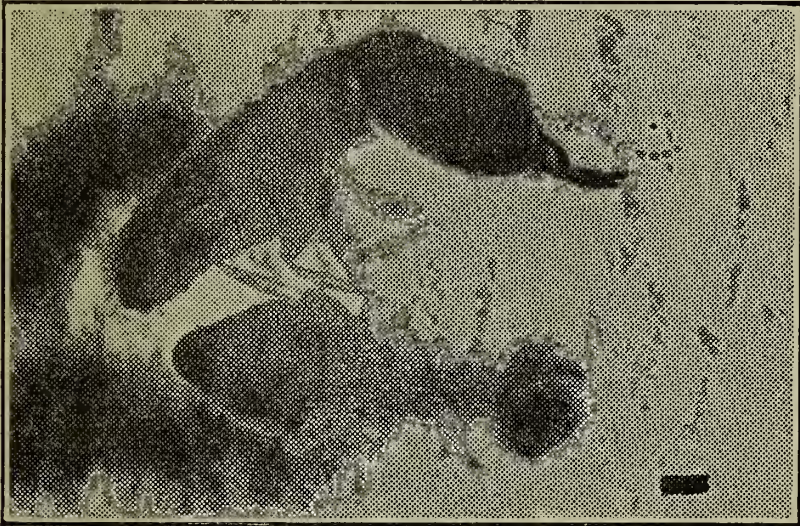
TERMITES can hardly be classified as household pests from a public health standpoint, but are very definitely an economical household pest and because of this are responsible for a great many demands upon the health department.

This insect, its life history and habits are of sufficient economical importance for separate and complete study of literature now available through many governmental agencies.

If you are certain that there are termites in your home, **DO NOT** call the Health Department—a carpenter or termite exterminator is what you need.

Refuse heaps or dumps resulting from the activities of the termites found in the basement below stanchions or joists may indicate the presence of these destructive insects. Some species of termites live partly in the ground and partly in wood and when developing their colonies construct covered runways which may pass over concrete walls or on the outside of

wooden supports. These covered passages consist of countless particles of earth or wood cemented together by the termites. If such runways are found, termites in all probability are present and eradication procedure should be undertaken immediately.



Termites (9x)

NOTE—Spot shows actual BODY size

If you are unable to identify termites the Department of Public Health will be glad to cooperate by investigating and advising.

EARWIGS

EARWIGS are rich reddish brown pests, flat of body, with three pairs of legs of dull yellow-brown color. At the end of the body are the forceps or pincers.

Habits: The earwig is a vegetable and flower pest and occurs in decayed wood. It is also a household pest in some sections. The nests are close to the house, in decaying planks, underneath boxes, lumber, flowers, etc.

Control: Trapping and the use of poison bran mixtures are recommended for its control.



Earwig (5x)

NOTE—Spot shows actual BODY size

PSITTACINE BIRDS

PSITTACINE BIRDS cannot be classified as household pests, but unfortunately they are household PETS and because of this and the fact that they are a potential public health menace, this space is devoted to them. This is written in order to properly inform those who have them as to the proper precautionary measures to follow.

Habits: In natural habitat, the good old Polly, the pretty love bird or shell parakeet and the majestic cockatoo and other members of the psittacine family flutter about tropical areas adding beauty to the surroundings. Because of the beauty of these birds, man has desired them within his own domicile. Therefore, the habits of these birds as generally encountered are usually confined to sitting on a perch within a small cage, proudly displaying their beauty, picking at sunflower seeds, hanging on perches with their sharp bills, picking at a piece of cuttle bone, endeavoring to mimic some human who is constantly saying "Polly want a cracker", or screeching with vigor, all the while disposing of their excreta in the bottom of the cage, which is quite often uncovered or not properly cleaned.

Disease Hazards: Psittacine birds are particularly subject to psittacosis, sometimes called "parrot fever". This disease is transmissible to man and has caused many fatal cases of illness.

Birds that become ill with this disease usually show definite symptoms which are readily

noticeable. The bird becomes "dumpy", feathers droop, eyes water and increased nasal secretions are noticeable. Should any pet show such symptoms do not hesitate to immediately arrange for humane removal. If you are doubtful, or suspicious, call the Department of Public Health for advice.

Contrary to popular belief, the disease is NOT transmitted to man by biting. Man acquires the disease through inhalation of the dust from the feathers and the excreta "droppings". It is always wise to exercise care while cleaning cages and to refrain from close contact. Do not train them to remove bits of food from between your lips or to perch on the shoulder or head.

If you do purchase psittacine birds, make sure that they are certified as required by the California State Law. This may be assured through inquiry of the local Department of Public Health.

DEAD ANIMALS

DEAD ANIMALS such as cats, dogs and other domestic animals sometimes cause considerable worry with respect to disposal of the carcass. Almost all communities have proper facilities for disposal of dead animals. Should such a problem arise on your premises, or if there is a carcass in an adjoining or neighborhood lot, or on the street or sidewalk, call the local Department of Public Health, giving the exact location. In a very short time, an attendant will call and remove the carcass.

PUPPIES AND KITTENS

Puppies and kittens not expected or wanted are at times a problem and a nuisance to the housewife. If a litter arrives and are not desired, call the local Society for the Prevention of Cruelty to Animals or the Health Department, and they will be promptly removed and humanely cared for.

If a child should bring home a stray dog or cat and it is not desired, do not turn it astray, follow the same procedure as suggested above.

POISON OAK

POISON OAK can hardly be classified as a household pest. It might, however, be called a garden pest. Most assuredly, one case of poison oak within the household can certainly disrupt the entire family—therefore, space in this manual is in order.

There are certain species of plants that belong to the Rhus or Sumac family. These plants, under certain conditions, exert a poisonous action upon the skin of persons, particularly those who are susceptible. It may be stated that the sum total of incapacity and economic loss arising from this cause cannot be estimated, to say nothing of bodily discomfort which the condition commonly causes.

There are several species of this poisonous plant, and the usual names applied to these are “poison ivy” and “poison oak”. As such, they are generally low erect plants or trailing shrubs, readily distinguished by their leaves, which are divided into three leaflets, and by their smooth, whitish waxy fruits, which re-



Poison oak (natural size)

semble mistletoe berries, and by their peculiar reddish color at certain seasons of the year. These plants, or vines, attach themselves to walls, trees, rocks, and various debris. The only places that poison ivy, or poison oak, does not grow are in the high mountain elevations, above 6000 feet at least.

The nature of the poison which causes a definite skin irritation is apparently due to some toxic principle. This principle is called toxicodentrol, which can be extracted from all portions of the plant, or vine. It is interesting to note that toxicodentrol is non-volatile, and previously these poisons were believed to be caused by volatile emanations from the plant.

Curiously, there are on record cases of poison oak which appear to have originated without direct contact with the plants, and this has brought up the interesting possibility of short distance poisoning. But the main source of the skin irritation is direct or indirect contact. There is no doubt that certain individuals are more susceptible than others, while in others immunity seems to exist, even after prolonged exposure. The symptoms may be present after exposure of a few hours to five days or longer, depending, of course, upon susceptibility, the degree of exposure, and the amount of resistance of the local anatomical parts. The symptoms likewise vary considerably—perhaps a slight itching or a burning sensation. Quite often, the inflammation develops and the burning or itching can become intense. The skin eruption shows wide diversity, it may be just a reddening, or in the

form of small blisters which may become infected and develop into ulcers and abscesses. Frequently, you find swelling and oedema of the parts involved.

The greatest interest has been with reference to prevention. Such plants can usually be handled with impunity if rubber gloves are worn, providing, however, none of the irritating material comes in contact with the body. If gloves have been used they should be thoroughly washed with soap and water. Even the water in which the gloves were washed may contain the poisonous principle. Inasmuch as clothing conveys the poison, a change of garment following exposure is recommended, which may include shoes. There can be used on the parts that are exposed such things as cottonseed oil, olive oil, or vaseline; but even these must be removed by a complete washing after exposure. One of the surest and best methods of individual prophylaxis is **the use of soap and hot water**. Washing should be done as soon after exposure as possible, using a soft brush or piece of gauze or cotton. Avoid using vigorous methods or a rough brush. It may be important to repeat the washing process after several hours; and, as a further preventive, alcohol diluted with equal quantities of water can be rubbed on the exposed portion.

With regard to treatment, it is most important that the family physician be called and, in serious cases, competent medical advice must be secured. Many of the treatments so used constitute solutions of permanganate of

potash, solutions of borax, solutions of hypsulphite of soda, and certain lotions well known to physicians.

Of greatest importance is the general destruction of all noxious vegetation. Every land owner should feel responsible for the illness resulting from exposure to the plants growing on his premises. In San Francisco there is a local ordinance which makes it a misdemeanor for the property owner for allowing such plants to grow, and he can be arrested, tried, and convicted following notice from the Department of Public Health. The most rapid and effective method of dealing with isolated clumps of these poisonous plants is simply to grub them out, taking care to remove thoroughly the running rootstocks which, if left in the ground, will produce another crop. Plowing of fields has been found to be satisfactory. The plants can be killed by mowing repeatedly. The use of kerosene has been recommended. Arsenite of soda has been used successfully, but this is definitely a poison and should be used with caution. One method prescribed is the use of hot brine solution, employing 3 pounds of salt per gallon of water.

PART II

THE CARE OF FOODSTUFFS IN THE HOME

Serious thought is usually given to the selection of foodstuffs for daily home consumption. Often, considerable time is consumed in meticulous care and preparation of certain dishes so that they may be particularly palatable. On the other hand, too frequently insufficient consideration is given to the proper care of foodstuffs during storage, handling, preparation and serving. In consideration of space, it would be impossible to discuss the proper care of all foods of our common daily diet. Therefore, discussion is offered under several general headings: meat; poultry; fish; dairy products; bakery goods; cereals and groceries; fruits and vegetables; beverages; preparation of food for picnic, church or neighborhood gatherings; and preparation of sandwiches and "cocktail tidbits". First, however, general facts on refrigeration, storage, preparation and handling will be considered.

Refrigeration: Whether by electric unit or by ice, refrigeration is indispensable in preserving the quality of foodstuffs. The interiors of ice boxes and cold units should be maintained in a scrupulously clean condition. Occasional washing of interiors with chlorinated water freshens up food-storage compartments. Such a solution consists of two tablespoons of ordinary household hypochlorite to one gallon of water.

Meats, fish, poultry, dairy products, certain bakery goods such as cream or custard-filled cakes and puddings should be kept under refrigeration as much as possible. Most vegetables and beverages are best maintained under refrigeration.

Food should not be placed in refrigerators in such manner as to allow contact with the floor or another article,—it would be best to protect each portion with waxed or soft, clean, white paper.

Chipped porcelain containers or dirty crockery should not be used to store foodstuffs. The interiors of cans in which canned goods are received are sterile and if not grossly contaminated after opening, are desirable containers for limited storage under refrigeration.

Refrigeration is inadequate if a temperature of 50° F. or less is not maintained, and this should be frequently checked by the thermometer.

Foodstuffs under storage of any kind should be covered with waxed or soft, clean, white paper whenever possible to avoid contamination from other material or from handling.

Coolers: Coolers constructed in the home or attached to windows or light-wells serve a useful purpose in the protection of food. The efficiency of such so-called coolers is limited, as is the safety of the articles of food that may be placed therein. This type of protection is not a substitute for refrigeration. Coolers should be rodent and insect-proof, as well as water-proof. Thorough cleaning at frequent intervals is essential.

Foodstuffs left over from one meal and intended for use at another should be carefully stored under proper refrigeration. It is poor policy to use warmed-over foodstuffs if the interval between original cooking and the time that the warmed-over foods would be consumed exceeds 36 hours. Certain bakery products and puddings, particularly those in which cream or custard fillings are used, must be carefully protected and not held over longer than 24 hours. Particularly is it essential to place such foods under adequate refrigeration after cooking. It is poor policy to cool prepared foodstuffs in the heated kitchen, and especially on the sill of open windows.

Storage of Dry Foodstuffs: All storage compartments should be rodent, insect and waterproof. Metal containers with tight-fitting covers are desirable and handy for storage of dry foodstuffs. Dry food-storage compartments should be kept clean. Every effort should be made to prevent spilling of one product into another, especially liquids.

Handling and Preparation: General cleanliness in food handling has improved considerably in recent years. In this day and age, the proprietor of a food shop, or the producer of foodstuffs, or the housewife can no longer neglect the general cleanliness of food products. Nor can these be carelessly handled or be stored in surroundings that are detrimental from a standpoint of sanitation, as by contact with animals or insects. The hygienic conscience of the people has been aroused and a

demand has been established for clean and wholesome foodstuffs.

Preparation of foodstuffs at home and in restaurants should be done under conditions that can only be classified as a high degree of sanitation. It is primarily essential that sterilization and cleanliness of kitchen utensils, glassware, crockery, silver and linen be of the highest degree. Personal hygiene and clothing of those engaged in the handling, preparation and serving of food should be beyond criticism. All cooks should realize that the use of the hands during the handling, preparation and serving of foodstuffs should be kept at a minimum.

The housewife or the cook in the home seems to feel that their surroundings are entirely different from those encountered where foodstuffs are prepared for commercial consumption. This feeling, no doubt, is due to the fact that home preparation and consumption is for and by the members of the family and that the cook and the methods employed are beyond criticism. The housewife or home cook can just as readily, and more often does, contaminate foodstuffs more often than the professional.

All food handlers should consider as personal hygiene, the cleanliness of their hands, particularly their finger nails. Hands should be washed frequently during preparation of foods. It is a good policy to have available a roll of absorbing paper for towels. Such material may be obtained at a very moderate

price and is a practical, economical article for household use, especially in the kitchen.

In the home, the kitchen should be used exclusively for the purpose for which it was intended. No other routine household duties or portion of same should be carried on in the kitchen while foodstuffs are being prepared. This is false conservation of space and time.

Under no circumstance should suspicious or decomposed foodstuffs be used. Never should a cook prepare and allow to be served any materials the quality of which is doubtful, and never endeavor to prove its safety by tasting or feeding to domestic animals. When in doubt the only safe method is to destroy such foodstuffs.

Poisoning by Food: It is recognized that food may be poisonous in itself, as in the commonly known mushroom poisoning; it may have become impregnated with metallic poisons, either accidentally or criminally, common metallic contaminants being arsenic and fluoride; it may convey infection because of carriers in diseases like amoebic dysentery, bacillary dysentery, typhoid fever, etc., it may affect human beings because of certain idiosyncracies of the human being to certain types of food, which is usually manifest in certain forms of shellfish and berries of various kinds; it may affect human beings because of certain deficiencies due to lack of vitamins; but, finally and most generally, food poisoning is due to bacteria and their products.

Food poisoning, as it is understood today, is the result, directly or indirectly, of the con-

tamination of food with certain bacteria. Clinically it may be classified as an intoxication. It is probably as old a condition as any of the diseases affecting the human being and consequently has been known by a much varied terminology.

Two Types of Food Poisoning: The scientific worker generally recognizes two types of food poisoning. One type is due to the contamination of the food with the paratyphoid-enteritidis group or other bacterial organisms such as the staphylococci, either through the agency of a human or animal carrier or from the meat of an animal suffering from a specific infection with these germs. Subsequent incubation of the contaminated food through improper and insufficient cooking, refrigeration or storage, allows the bacteria to secrete, in their growth, a poisonous product, or, perhaps in the process of heating, certain products become soluble and evidently poisonous. The consumption of such food is followed within several hours by symptoms of nausea, abdominal pain, vomiting, prostration, diarrhea, and perhaps fever. Complete recovery within forty-eight hours is the rule.

The other type of food poisoning is known as botulism. It is due to the contamination of the food with a specific bacterium known generally as the "Bacillus botulinus". This germ is found in the soil practically throughout the world. It exists in nature in the form of a spore and as such is not poisonous. When so-called non-acid or slightly acid foods, such as many vegetables, fish, and meat, are preserved

by faulty and insanitary methods, botulinus poisoning may occur. The symptoms usually appear within twenty-four to forty-eight hours after the consumption of the poisonous food. There may be marked muscular weakness, disturbances of vision, loss of ability to swallow and talk, constipation, rapid pulse and subnormal temperature, rarely any pain, and death from respiratory failure. This somewhat rare type of poisoning, so serious because of its high death rate, has apparently been eliminated from commercially canned foods. It is regrettable that home-canning methods antedate the present-day knowledge of botulism and that, with a few exceptions, no effort has been made to correct them. Only boiling for a sufficient length of time after removal from the glass jar or can before being served, or preservation in at least 10% brine solutions, will make home-canned foods reasonably safe.

MEATS

Meat and meat products are one of the most common articles of daily diet and one of the most perishable, therefore utmost precaution must be exercised in its handling and preservation by refrigeration.

Ground meat such as hamburger may contain bacteria which widely exist in the air and on the hand, and may be distributed throughout the mass from unclean equipment or may have been an original contaminant of the meat. The process of cooking in the home is likely to destroy the bacteria present. If the meat is

not subjected to a very thorough cooking, a large number of living and perhaps harmful bacteria and their products or parasites will be consumed.

Spoilage: Spoilage is a complex process and regardless of experience it may often prove difficult to judge some meat as fit for human consumption. When in doubt remove and destroy the article.

Food poisoning is not usually accomplished by spoiled food—it is due to contamination by bacteria and their products and through the medium of living parasites.

Chemical Preservatives: The use of chemical preservatives, especially for the retention of color as in hamburgers, is illegal. When used they are easily detected and persons responsible are subject to arrest and fines.

Hamburger Steak: Hamburger steak consists of a major portion of lean beef and a small percentage of fat. It should NOT be ground in the same machine in which pork or sausage has been ground unless the machine is first properly and thoroughly cleansed. Pork is to be used in hamburger only at the specific request of the purchaser, and if pork is contained in the hamburger steak it must be cooked thoroughly.

Salami: The manufacture of salami, mettwurst, and other material containing raw pork is surrounded by adequate regulations when done on a commercial basis. Home preparation of this material should never be carried on.

Bear Meat and Deer Meat: The meat of deer and bear should be cooked thoroughly when being prepared for home consumption. As a matter of fact, it is advisable to eat bear meat only after microscopic examination has been made.

REMEMBER TO THOROUGHLY COOK ANY TYPE OF PORK!

POULTRY

The information contained in the chapter on meat can also be applied to poultry. Poultry, however, is not as common an article of diet as meat and for this reason its usages in the home are somewhat different from the routine use of other types of meat. The method of cooking poultry varies considerably. It is common to cook poultry employing the use of dressing. Sometimes these dressings are made of various mixtures and are highly spiced. Utmost care should be exercised in making these dressings.

A common procedure is to use the meat left on the carcass of fowl after the main meal for sandwiches and creamed poultry. Creamed sauces made to serve with cold poultry should be given special attention during their preparation, storage and handling. No opportunity should be afforded for contamination by the hands or other sources.

FISH

Fish, particularly shellfish, are highly perishable products, and should be under proper refrigeration at all times. All fish should be

cooked thoroughly. When the quality of shellfish is questionable it should never be used under any circumstances.

Promiscuous gathering of clams and oysters for home consumption is not recommended. If doubt exists as to the quality of such shellfish, purchased or personally gathered, it would be wise to call the local health department.

Mussels are shellfish which can readily be placed in the category of highly dangerous foods. Illness resulting from mussels has caused a number of fatalities. Each year in California public warning is given against the gathering and consumption of mussels during certain periods of the year. By all means contact the local or State health department for information as to quarantine periods.

DAIRY PRODUCTS

Dairy products as a whole are highly perishable and it is essential that they be kept under proper refrigeration as much as possible.

Particularly is this true of milk, cream and butter, and it is good economy to do the same with eggs, cheese and ice cream. Present dairy laws surround milk and milk-food products with every safeguard. These laws are such that dairy products can be guaranteed to be in good wholesome condition when delivered to the home or retail store.

An important fact to keep in mind in relation to dairy products and refrigeration is that if certain of these products, such as butter, milk and cream, are improperly stored in close proximity to other foodstuffs, particu-

larly those from which an odor emanates, there is a possibility that the dairy products will absorb the odor which, of course, would be reflected in the taste.

In the case of the retail store, when milk is delivered by the dairyman it never should be allowed to remain outside of the ice box. Regardless of how busy the shopkeeper may be, milk, cream and butter should immediately be placed under refrigeration when delivered by the wholesaler.

In the home, it is poor policy to allow milk to remain on the doorstep for any length of time. A habit should be formed of taking the milk within the premises and placing it under refrigeration shortly after delivery by the milkman. Milk, cream or butter should never be left standing in a warm section of the house. These products should be properly covered at all times, and it is well to form the habit of properly cleansing the lip of milk or cream bottles before pouring.

Milk and cream is now being dispensed in some instances in paper containers. These paper cartons are made to withstand the usual handling that a glass bottle would receive in reference to refrigeration. Therefore this type of container should be kept under the same refrigeration as milk and cream in glass bottles.

BAKERY GOODS

Certain bakery goods such as cream-filled eclairs, custard-filled products, iced cakes and pastries should be handled very carefully.

Regulations governing the manufacture of cream custard pastry products:

1. Hot water at a temperature of not less than 185° Fahrenheit shall be available and of free access for the cleaning of equipment and for the personal cleanliness of all employees.
2. In addition to the cleansing in hot water, the equipment will be rinsed also with hot water containing free chlorine in a concentration of not less than 25 parts per million (one teaspoonful per gallon of water as an average).
3. In the manufacture of cream custard, to be used as a filling for eclairs, puffs, cakes, etc., the mixture of all ingredients must be brought to a boiling temperature (212° Fahrenheit or 100° Centigrade) and held at that temperature for a full five-minute period as a minimum.
4. After being cooked at boiling temperature for a period of five minutes, the cream custard mixture must be cooled as rapidly as possible and within thirty minutes to a temperature of not greater than 45° Fahrenheit (or 7.2° Centigrade) and held at that temperature, under clean refrigeration and in a closed container until used for injecting pastry shells for or spreading layer cakes; except that in those instances in which the freshly prepared hot cream custard mixture is to be used **immediately** for injecting pastry shells or making layer cakes, the cooling as outlined shall not be required.

5. If, in the rapid cooling of the mixture, it is necessary to use the marble slab or other large surface for aeration and beating of the custard, such surface must be carefully and thoroughly scoured and cleaned with a hot water solution, rinsed off with water containing free chlorine in a concentration of at least 25 parts per million (one teaspoonful per gallon of water, average), and dried with a clean cloth, all immediately before use.
6. All personnel shall use the utmost care in personal cleanliness, particularly of the outer clothing and of the hands at all times.
7. Manual handling of products will be minimized as much as possible in all procedures involved in the manufacture of cream custard pastry products particularly.
8. In the injection of pastry shells, the use of canvas, muslin or rubber bags is prohibited. The injection apparatus may include a vegetable parchment bag, to be discarded immediately after use, or may be of all-metal plunger type, provided such equipment can be properly cleaned and sterilized.
9. Canvas or other bags may be used for the handling of materials and mixtures used in the manufacture of fancy cookies and other products subjected to oven temperatures after passage through the bag. Such bags and tips or nozzles, however, must

be thoroughly cleaned and boiled in water for at least ten minutes after use, and stored and dried in suitable clean airy compartments free from dust and other contaminants.

The foregoing are primarily instructions for the commercial handling of this material. The housewife or the home cook, however, can benefit by following these methods when preparing such products.

CEREALS AND GROCERIES

All cereals should be kept in a dry clean storage compartment. Tin containers with tight-fitting lids are most desirable. Grocery products should also be stored in dry clean compartments. All canned goods after opening should be kept under refrigeration.

BEVERAGES

A good many fruit and vegetable juices usually used in the breakfast meal are now available in cans. Sometimes the entire contents of a can is not used at the time that it is opened. Such remaining juices should be carefully stored in a clean container or allowed to remain in the can under refrigeration.

There are available certain instruments that are recommended for the extraction of fresh fruit and vegetable juices for human consumption. Such procedure should be carried out very carefully. As a matter of fact, the following regulations apply to commercial establishments in San Francisco :

1. Persons, firms or corporations, before engaging in the preparation and sale of fresh fruit and vegetable juices, must secure a permit to operate a food establishment from the Department of Public Health.
2. The premises occupied for the purpose of conducting such business must be made to comply with the requirements of the Department of Public Health and the rules and regulations embodied in Ordinance Number 2917 (regulating food establishments). (Such requirements will be furnished the applicant at the time application for permit is filed.)
3. Extracting machines shall be kept in a clean and sanitary condition at all times and sterilized by approved methods before re-use. Such equipment as is used in the extraction process and in the storage of the juices must be of simple construction and easily cleanable.
4. Unless the juices are to be consumed immediately after extraction and on the premises, they must be placed at once in sterile containers, properly capped and pasteurized (at temperature of 142-145° Fahrenheit for thirty minutes) and immediately cooled to a temperature of not higher than 50° Fahrenheit. No fresh juices are to be kept or offered for sale for a period longer than the same day that they are extracted.

5. Non-compliance with these requirements will be considered sufficient cause for revocation of the permit to operate a food establishment extracting and offering for sale such fresh fruit and vegetable juices.

Consideration should be given to these requirements during home preparation of such juices. Thorough washing, particularly of vegetables, is essential.

FRUITS AND VEGETABLES

Fruits and vegetables should be stored preferably in coolers. Certain vegetables, such as celery, lettuce, carrots, turnips, beets, radishes, etc., should be thoroughly washed before using, particularly if the vegetable is intended to be used in the raw state for salads.

The sale of WATERCRESS except from certified sources is prohibited in San Francisco, and promiscuous home use of this material should not be practiced.

Certain fruits not covered by a skin that is normally removed before eating such as berries, cherries, grapes, etc., should be thoroughly washed prior to using. It is also good policy to wash those fruits, the skin of which is usually removed prior to eating such as apples, peaches, apricots, etc.

Display of fruits and vegetables on sidewalks and in open areas by commercial dealers is not advisable. Such display of certain fruits is illegal in San Francisco.

SAUCES

The preparation of sauces of various types should be surrounded by every safeguard. Sauces should not be made too far in advance of the meal at which they are to be served, and adequate refrigeration is essential for proper care.

In the case of the commercial preparation of Hollandaise Sauce the following regulations apply:

1. Use cheesecloth only once for each preparation. It may be used again, however, after proper sterilization.
2. Keep utensil containing the Hollandaise sauce covered.
3. Keep the Hollandaise sauce cool, but not under refrigeration temperature.
4. Delegate one—and only one—employee to take charge of the preparation and handling of Hollandaise sauce.
5. The sauce should be used the day it is prepared, and none held over until the following day.

In preparing cream sauces, particular attention must be given to personal hygiene, especially cleanliness of the hands, and again adequate refrigeration is essential.

The application of butter, syrup, frosting and other such substances, particularly in instances in which the toast, pastry, cake or other product is to be eaten without further heating, should be done in a very careful manner. The use of paint brushes or other such

devices is prohibited in commercial establishments and is not good culinary practice in the home.

HOME PREPARATION OF FOODSTUFFS FOR BAZAARS, NEIGHBORHOOD OR COMMUNITY PICNICS AND OTHER GATHERINGS.

When food is to be served on an occasion where a group of people of a certain organization or neighborhood are gathered, the food is usually prepared in the homes of several or many of the various members of the organization. Such home preparation of foodstuffs should at all times be carefully carried out. Particularly, should the transportation and care of the foodstuffs from the home to the place of consumption be surrounded with every safeguard. It is important that this whole preparation be carried on within a reasonably short time prior to the time set for the consumption of the food. Overnight preparation or preparation where there would be a long delay prior to eating is inadvisable and should never be done. In any event, such foodstuffs prepared in quantity should be subjected to a minimum or no contact with the human hand and always kept under refrigeration.

SANDWICHES AND "COCKTAIL TIDBITS"

The preparation of sandwiches may be of major consequence, particularly since it is necessary to frequently handle by hand. Therefore, the materials of most importance are the so-called spreads such as cheese, minced meats

both raw and cooked, with and without cream sauces, sausages, egg mixtures, etc.

Sandwiches and "cocktail tidbits" should be used shortly after being prepared, or protected by refrigeration and waxed paper if delayed in consumption for even one or two hours. Spreads of any kind, especially those prepared from egg mixtures, should receive careful attention as to manipulation, this only being done by clean mechanical devices such as knives, spoons and hands.

Pork sausages should always be thoroughly cooked notwithstanding hurried demands for service.

PART III

HOME CARE OF THE ILL

A sick person may be cared for in the home effectively, provided certain fundamentals are understood. Orders given by the physician attending the case should be followed completely in every detail. If there is any doubt about the orders questions should be asked by the person attending the patient. Such details as taking the temperature, use of bedpan, giving of enema, changing of linen, call for special instructions by either the physician or a trained nurse. Only one member of the family should attempt to take care of the patient and as far as possible should not mingle with the rest of the family.

The detailed routine of the patient will be under the strict orders of the physician and naturally depends upon the seriousness of the illness. It is wise to have the patient in a separate room, easily ventilated, well screened, and free of unnecessary furniture and draperies. Here the patient should be isolated from other members of the family. Facilities for washing the hands of the attendant are necessary unless an adjacent bathroom is available. However, it is wise in the sick room to have available a wash basin containing a 1% lysol solution in order that the attendant may rinse her hands after touching the patient.

It is important that the attendant follow rules which will not only serve to avoid the spread of the infection to other members of the family, but will safeguard the health of

the attendant as well. The chief source of infection from the patient is from the body discharges. These include discharges from the nose, droplet infection from the mouth, discharges from the urinary and intestinal tracts. In intestinal diseases, such as typhoid or dysentery, the intestinal and urinary discharges, and the bath water used to bathe the patient, should be disinfected by mixing with a 5% lysol solution, and left for two hours before emptying into the drains leading to the sewer.

The attendant should insist upon the patient covering his face when coughing or sneezing. All pets should be kept out of the sickroom. It seems unnecessary to mention it, but the attendant should not kiss the patient or touch the patient more than is necessary. Special caution is necessary regarding the attendant touching his own mouth or face with his fingers. Hands are most important in conveying infection from a contagious case.

All materials used or soiled by the patient must be given special care. The dishes should be boiled and kept separate from the general family dishes. Linen, likewise, must be boiled. The use of paper plates, napkins and utensils is desirable. All waste material such as food, dressings or paper should be burned. In disinfecting the sickroom after the patient is well, sunshine may be used on certain articles which cannot be boiled and need not be destroyed. These include books, pillows, mattresses and toys. Throughout the care of the illness by the attendant, it is wise for the attendant to wear a smock or some type of outer garment,

which is worn in the sickroom and is kept there and removed before the attendant leaves the room. Washing of the hands thoroughly should follow the removal of this outer garment.

Details of special cases should naturally be governed by the physician in charge of the case.

PART IV

STERILIZATION OF DISHES

During cases of disease it is often necessary to render safe dishes which have been used by the sick person. There are many ways other than by dishes that disease may be transmitted to other members of the family, but dishes may be one of the most serious routes because healthy people in the family as well as patients may come in such close contact with them. It is well to use paper handkerchiefs dropped in a paper container and burned and to use general precautions with regard to bedding and anything handled by the patient.

One should remember that dishes that are nicked or cracked should not be used for sick people because such dishes are more difficult to disinfect. Dishes may be on a newspaper or the like on a clean table or tray and removed to the nearest convenient spot. Remnants of food are best scraped into an incinerator or into a paper of ample size which is taken to the garbage can, handling the package only from the outside. Dishes themselves may be placed in chlorine solution for about

half an hour. They should be completely immersed so that the liquid touches all parts of each dish. The chlorine solution should have about "200 parts per million" of chlorine which may be secured by using a cheap powder, such as sterichlor, available in most drug stores, and following the directions on the package. The solution may be used over a one-day period, or two days if it does not get too dirty. If it is simpler, dishes may be placed directly in a large pan on the stove and immersed in water and boiled for a minute or more instead of using chlorine solution. It is necessary to remember that the hands which handle these dishes before treatment are also probably loaded with germs, so that nothing should be touched until the dirty work is done except those things which are to be disinfected.

